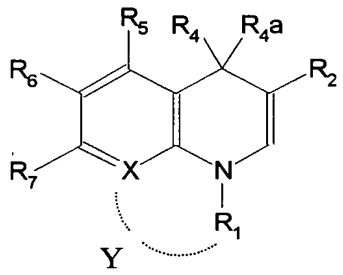
Claims

59. A method for treating a microbial infection in an animal said infection caused by a microbe, comprising administering to the animal suffering from said infection an antimicrobial agent and an efflux pump inhibitor in an amount sufficient to reduce efflux pump activity,

wherein said efflux pump inhibitor increases the susceptibility of said microbe to said antimicrobial agent, and

wherein said efflux pump inhibitor has the chemical structure of structure I below:



Structure I

wherein,

R_1 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, or optionally substituted aryl, aralkyl, arylaminoalkyl,

aryloxyalkyl,

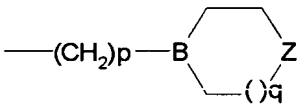
arylS(O)$_t$alkyl, where t is 0,1 or 2;

R_2 is H, CHO, $COOR_3$, or $CONHR_{13}$,

where R_{13} is H or the NHR_{13} of $CONHR_{13}$ is the residue of one of the 20 naturally occurring amino acids: alanine, arginine, asparagines, aspartic acid, cysteine,

glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, valine or the optically active isomers thereof or the racemic mixtures thereof, or combinations of these amino acids to give dipeptidyl, tripeptidyl or polypeptidyl residues;

R_3 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, aryl, aralkyl, arylaminoalkyl, aryloxyalkyl, arylS(O)$_t$alkyl, where t is 0,1 or 2; or R^3 is $(CH_2)_nCH(R_{14})OC(=O)R_{15}$, $(CH_2)_nCH(R_{14})C(=O)OR_{15}$ wherein n is 0-6, R_{14} is H or CH_3; and R_{15} is C_2H_5 or $C(CH_3)_3$;

or R_3 is 

wherein B is CH or N, and when B is CH, Z is NH or NCH_3, and when B is N, Z is CH, O, NH, S or NCH_3, p is 0-2 and q is 0-2;

R_4 is H, R_{4a} is H, or R_4 and R_{4a} taken together are oxo (=O), or thio (=S);

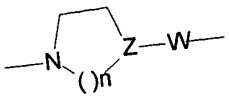
R_5 is H, C_{1-5} alkyl, amino, alkylamino, or acylamino;

R_6 is H, C_{1-6} alkyl, halo, amino, or hydroxy;

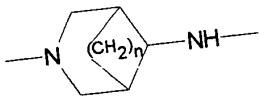
R_7 is OH, halo or NR_9R_{10} wherein R_9 and R_{10} are the same or different and represent H, C_{1-6} alkyl or $(CH_2)_nOA$,

or R_9 is H and R_{10} is a 4-membered, 5-membered, 6-membered, or 7-membered carbocyclic, mono or bicyclic ring or mono or bicyclic heterocyclic ring linked to the nitrogen of NR_9R_{10} through an atom of the heterocycle other than the heterocyclic atom or R_9 and R_{10} taken together with the nitrogen atom to which they are attached form part of a heterocycle which heterocycle is monocyclic or bicyclic, and said carbocycle or heterocycle is optionally substituted;

or R_7 is NHOA, $NHCOOR_{11}$, or $NH(CH_2)_nNR_9R_{10}$;

or R_7 is  where n is 1, 2 or 3, Z is CH or N, and when Z is CH, W is NH

or when Z is N, W is absent;

or  where n is 0, 1, or 2

wherein the R_7 moiety is linked either to 2 core molecules of the Formula I to form a bis compound or the R_7 moiety has one of its link bonds linked to the core formula of Formula I and the second of its link bonds is linked to an optionally substituted phenyl carboxylic acid or ester moiety thereof,

A is H, C_{1-6} alkyl, glycosyl, aralkyl, C_{1-6} alkanoyl or aminoalkanoyl wherein the aminoalkanoyl group may be an aminoacid residue derived from one of the one of the 20 naturally occurring amino acids or the optically active isomers thereof, or the racemic mixtures thereof wherein the amino residue is derived from alanine, arginine, asparagine, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, or valine; or

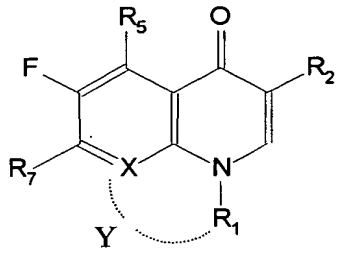
A is $C_6H_{11}O_6$, SO_3H, or PO_3H_2,

R_{11} is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, or heterocyclic group,

X is CH, C-F, C-Cl, C-CH_3, C-CF_3, C-OCH_3, C-$OCHF_2$, C-OCF_3, N or when X is equal to C, the nitrogen atom to which R_1 is linked forms an optionally substituted 5-membered ring, 6-membered ring, 7-membered ring, with X of the adjacent ring, the ring containing carbon atoms and optionally one or more Y atoms wherein the one or more Y atoms are the same or different and are selected from NH, O or S; if the ring is substituted, the substituent is C_{1-6} alkyl group;

and its pharmaceutically acceptable salts, hydrates, polymorphs and pseudopolymorphs.

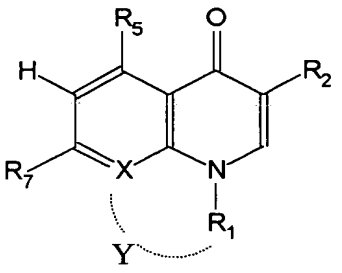
60. A method according to claim 59 wherein the efflux pump inhibitor has structure 2



Structure 2

wherein, R_1, R_2, R_5, R_7, X and Y are as defined in claim 59.

61. A method according to claim 59 wherein the efflux pump inhibitor has structure 3

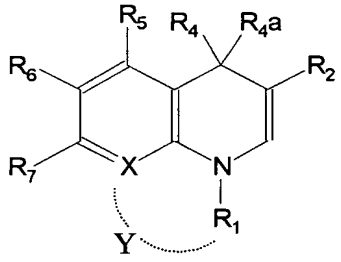


Structure 3

wherein R_1, R_2, R_5, R_7, X and Y are as defined in claim 59.

62. A method for prophylactic treatment of an animal at risk for developing a microbial infection by a microbe comprising administering to the animal an antimicrobial agent and an efflux pump inhibitor in an amount sufficient to reduce efflux pump activity, wherein said efflux pump inhibitor increases the susceptibility of said microbe to said antimicrobial agent, and

wherein said efflux pump inhibitor has the chemical structure of structure 1 below:



Structure I

wherein,

R_1 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, or optionally substituted aryl, aralkyl, arylaminoalkyl,

aryloxyalkyl,

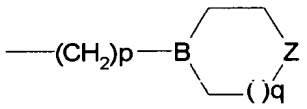
arylS(O)$_t$alkyl, where t is 0, 1 or 2;

R_2 is H, CHO, $COOR_3$, or $CONHR_{13}$,

where R_{13} is H or the NHR_{13} of $CONHR_{13}$ is the residue of one of the 20 naturally occurring amino acids: alanine, arginine, asparagines, aspartic acid, cysteine,

glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, valine or the optically active isomers thereof or the racemic mixtures thereof, or combinations of these amino acids to give dipeptidyl, tripeptidyl or polypeptidyl residues;

R_3 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, aryl, aralkyl, arylaminoalkyl, aryloxyalkyl, $arylS(O)_talkyl$, where t is 0,1 or 2; or R^3 is $(CH_2)_nCH(R_{14})OC(=O)R_{15}$, $(CH_2)_nCH(R_{14})C(=O)OR_{15}$ wherein n is 0-6, R_{14} is H or CH_3; and R_{15} is C_2H_5 or $C(CH_3)_3$;

or R_3 is 

wherein B is CH or N, and when B is CH, Z is NH or NCH_3, and when B is N, Z is CH, O, NH, S or NCH_3, p is 0-2 and q is 0-2;

R_4 is H, R_{4a} is H, or R_4 and R_{4a} taken together are oxo (=O), or thio (=S);

R_5 is H, C_{1-5} alkyl, amino, alkylamino, or acylamino;

R_6 is H, C_{1-6} alkyl, halo, amino, or hydroxy;

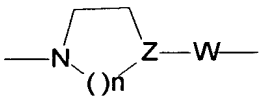
R_7 is OH, halo or NR_9R_{10} wherein R_9 and R_{10} are the same or different and represent H, C_{1-6} alkyl or

$(CH_2)_nOA$,

or R_9 is H and R_{10} is a 4-membered, 5-membered, 6-membered, or 7-membered carbocyclic, mono or bicyclic ring or mono or bicyclic heterocyclic ring linked to the nitrogen of NR_9R_{10} through an atom of the heterocycle other than the heterocyclic atom or R_9 and R_{10} taken together with the nitrogen atom to which they are attached form part

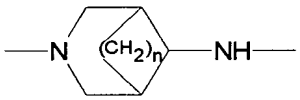
of a heterocycle which heterocycle is monocyclic or bicyclic, and said carbocycle or heterocycle is optionally substituted;

or R_7 is NHOA, $NHCOOR_{11}$, or $NH(CH_2)_nNR_9R_{10}$;

or R_7 is  where n is 1, 2 or 3, Z is CH or N, and when Z is CH, W is NH

or

when Z is N, W is absent;

or  where n is 0, 1, or 2

wherein the R_7 moiety is linked either to 2 core molecules of the Formula I to form a bis compound or the R_7 moiety has one of its link bonds linked to the core formula of Formula I and the second of its link bonds is linked to an optionally substituted phenyl carboxylic acid or ester moiety thereof,

A is H, C_{1-6} alkyl, glycosyl, aralkyl, C_{1-6} alkanoyl or aminoalkanoyl wherein the aminoalkanoyl group may be an aminoacid residue derived from one of the one of the 20 naturally occurring amino acids or the optically active isomers thereof, or the racemic mixtures thereof wherein the amino residue is derived from alanine, arginine, asparagine, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, or valine; or,

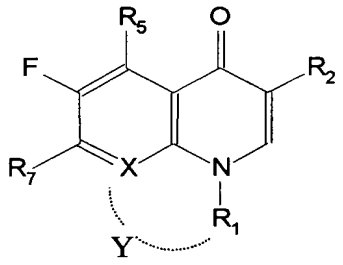
A is $C_6H_{11}O_6$, SO_3H, or PO_3H_2,

R_{11} is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, or heterocyclic group,

X is CH, C-F, C-Cl, C-CH_3, C-CF_3, C-OCH_3, C-$OCHF_2$, C-OCF_3, N or when X is equal to C, the nitrogen atom to which R_1 is linked forms an optionally substituted 5-membered ring, 6-membered ring, 7-membered ring, with X of the adjacent ring, the ring containing carbon atoms and optionally one or more Y atoms wherein the one or more Y atoms are the same or different and are selected from NH, O or S; if the ring is substituted, the substituent is C_{1-6} alkyl group;

and its pharmaceutically acceptable salts, hydrates, polymorphs and pseudopolymorphs.

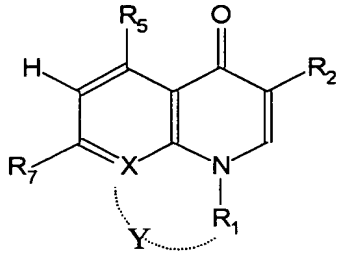
63. A method according to claim 62 wherein the efflux pump inhibitor has structure 2



Structure 2

wherein R_1, R_2, R_5, R_7, X and Y are as defined in claim 62.

64. A method according to claim 62 wherein the efflux pump inhibitor has structure 3



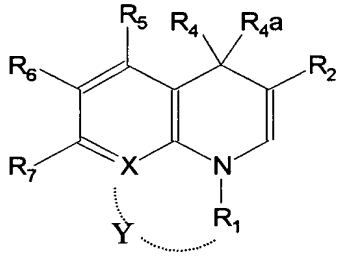
Structure 3

wherein R_1, R_2, R_5, R_7, X and Y are as defined in claim 62.

65. The method of any one of claims 59 to 64 wherein said animal is a mammal.

66. A method of enhancing the antimicrobial activity of an antimicrobial agent against a microbe, comprising contacting said microbe with said antimicrobial agent and an efflux pump inhibitor in an amount effective to inhibit an efflux pump in said microbe,

wherein said efflux pump inhibitor has the chemical structure of structure I below:



Structure I

wherein,

R_1 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, or optionally substituted aryl, aralkyl, arylaminoalkyl,

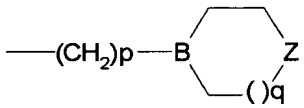
aryloxyalkyl,

arylS(O)$_t$alkyl, where t is 0,1 or 2;

R_2 is H, CHO, $COOR_3$, or $CONHR_{13}$,

where R_{13} is H or the NHR_{13} of $CONHR_{13}$ is the residue of one of the 20 naturally occurring amino acids: alanine, arginine, asparagines, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, valine or the optically active isomers thereof or the racemic mixtures thereof, or combinations of these amino acids to give dipeptidyl, tripeptidyl or polypeptidyl residues;

R_3 is H, $C_{1\text{-}6}$ alkyl, $C_{3\text{-}6}$ cycloalkyl, aryl, aralkyl, arylaminoalkyl, aryloxyalkyl, arylS(O)$_t$alkyl, where t is 0, 1 or 2; or R^3 is $(CH_2)_nCH(R_{14})OC(=O)R_{15}$, $(CH_2)_nCH(R_{14})C(=O)OR_{15}$ wherein n = 0-6, R_{14} = H or CH_3; and R_{15} is C_2H_5 or $C(CH_3)_3$;

or R_3 is 

wherein B is CH or N, and when B is CH, Z is NH or NCH_3, and when B is N, Z is CH, O, NH, S or NCH_3, p is 0-2 and q is 0-2;

R_4 is H, R_{4a} = H, or R_4 and R_{4a} taken together are oxo (=O), or thio (=S);

R_5 is H, $C_{1\text{-}5}$ alkyl, amino, alkylamino, or acylamino;

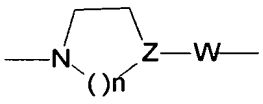
R_6 is H, $C_{1\text{-}6}$ alkyl, halo, amino, or hydroxy;

R_7 is OH, halo or NR_9R_{10} wherein R_9 and R_{10} are the same or different and represent H, $C_{1\text{-}6}$ alkyl or $(CH_2)_nOA$,

or R_9 is H and R_{10} is a 4-membered, 5-membered, 6-membered, or 7-membered carbocyclic, mono or bicyclic ring or mono or bicyclic heterocyclic ring linked to the nitrogen of NR_9R_{10} through an atom of the heterocycle other than the heterocyclic atom

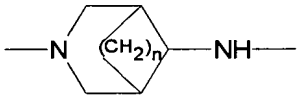
or R_9 and R_{10} taken together with the nitrogen atom to which they are attached form part of a heterocycle which heterocycle is monocyclic or bicyclic, and said carbocycle or heterocycle is optionally substituted;

or R_7 is $NHOA$, $NHCOOR_{11}$, or $NH(CH_2)_nNR_9R_{10}$;

or R_7 is  **where n is 1, 2 or 3, Z is CH or N, and when Z is CH, W is NH**

or

when Z is N, W is absent;

or  **where n is 0, 1, or 2**

wherein the R_7 moiety is linked either to 2 core molecules of the Formula I to form a bis compound or the R_7 moiety has one of its link bonds linked to the core formula of Formula I and the second of its link bonds is linked to an optionally substituted phenyl carboxylic acid or ester moiety thereof,

A is H, C_{1-6} alkyl, glycosyl, aralkyl, C_{1-6} alkanoyl or aminoalkanoyl wherein the aminoalkanoyl group may be an aminoacid residue derived from one of the one of the 20 naturally occurring amino acids or the optically active isomers thereof, or the racemic mixtures thereof wherein the amino residue is derived from alanine, arginine, asparagine, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine,

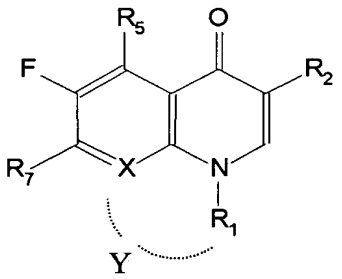
lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, or valine; or,

A is $C_6H_{11}O_6$, SO_3H, or PO_3H_2,

R_{11} is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, or heterocyclic group,

X is CH, C-F, C-Cl, $C-CH_3$, $C-CF_3$, $C-OCH_3$, $C-OCHF_2$, $C-OCF_3$, N or when X is equal to C, the nitrogen atom to which R_1 is linked forms an optionally substituted 5-membered ring, 6-membered ring, 7-membered ring, with X of the adjacent ring, the ring containing carbon atoms and optionally one or more Y atoms wherein the one or more Y atoms are the same or different and are selected from NH, O or S; if the ring is substituted, the substituent is C_{1-6} alkyl group; and its pharmaceutically acceptable salts, hydrates, polymorphs and pseudopolymorphs.

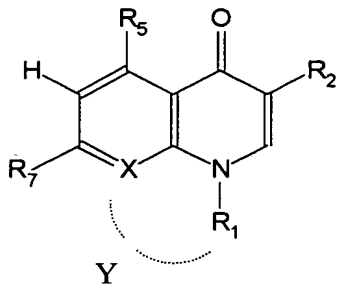
67. The method of claim 66 wherein said efflux pump inhibitor has structure 2



Structure 2

wherein R_1, R_2, R_5, R_7, X and Y are as defined in claim 66.

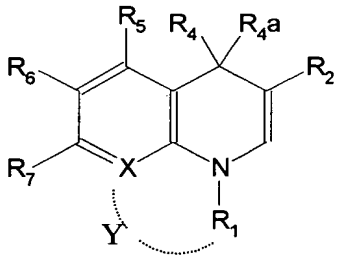
68. A method according to claim 66 wherein the efflux pump inhibitor has structure 3



Structure 3

wherein R_1, R_2, R_5, R_7, X and Y are as defined in claim 66.

69. The method of suppressing growth of a microbe expressing an efflux pump, comprising contacting said microbe with an efflux pump inhibitor in the presence of a concentration of antimicrobial agent below the MIC of said antimicrobial to said microbe, wherein said efflux pump inhibitor has the chemical structure of structure I below:



Structure I

wherein,

R_1 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, or optionally substituted aryl, aralkyl, arylaminoalkyl,

aryloxyalkyl,

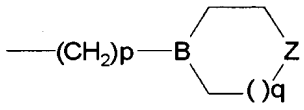
arylS(O)$_t$alkyl, where t is 0, 1 or 2;

R_2 is H, CHO, $COOR_3$, or $CONHR_{13}$,

where R_{13} is H or the NHR_{13} of $CONHR_{13}$ is the residue of one of the 20 naturally occurring amino acids: alanine, arginine, asparagines, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, valine or the optically active isomers thereof or the racemic mixtures thereof, or combinations of these amino acids to give dipeptidyl, tripeptidyl or polypeptidyl residues;

R_3 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, aryl, aralkyl, arylaminoalkyl, aryloxyalkyl,

arylS(O)$_t$alkyl, where t is 0, 1 or 2; or R^3 is $(CH_2)_nCH(R_{14})OC(=O)R_{15}$, $(CH_2)_nCH(R_{14})C(=O)OR_{15}$ wherein n = 0-6, R_{14} = H or CH_3; and R_{15} = C_2H_5 or $C(CH_3)_3$;

or R_3 is 

wherein B is CH or N, and when B is CH, Z is NH or NCH_3, and when B is N, Z is CH, O, NH, S or NCH_3, p is 0-2 and q is 0-2;

R_4 is H, R_{4a} is H, or R_4 and R_{4a} taken together are oxo (=O), or thio (=S);

R_5 is H, C_{1-5} alkyl, amino, alkylamino, or acylamino;

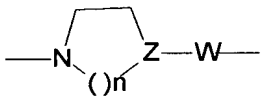
R_6 is H, C_{1-6} alkyl, halo, amino, or hydroxy;

R_7 is OH, halo or NR_9 R_{10} wherein R_9 and R_{10} are the same or different and represent H, C_{1-6} alkyl or

$(CH_2)_nOA$,

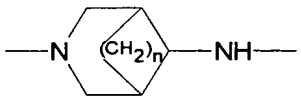
or R_9 is H and R_{10} is a 4-membered, 5-membered, 6-membered, or 7-membered carbocyclic, mono or bicyclic ring or mono or bicyclic heterocyclic ring linked to the nitrogen of NR_9R_{10} through an atom of the heterocycle other than the heterocyclic atom or R_9 and R_{10} taken together with the nitrogen atom to which they are attached form part of a heterocycle which heterocycle is monocyclic or bicyclic, and said carbocycle or heterocycle is optionally substituted;

or R_7 is NHOA, $NHCOOR_{11}$, or $NH(CH_2)_nNR_9R_{10}$;

or R_7 is  where n is 1, 2 or 3, Z is CH or N, and when Z is CH, W is NH

or

when Z is N, W is absent;

or  where n is 0, 1, or 2

wherein the R_7 moiety is linked either to 2 core molecules of the Formula I to form a bis compound or the R_7 moiety has one of its link bonds linked to the core

formula of Formula I and the second of its link bonds is linked to an optionally substituted phenyl carboxylic acid or ester moiety thereof,

A is H, C_{1-6} alkyl, glycosyl, aralkyl, C_{1-6} alkanoyl or aminoalkanoyl wherein the aminoalkanoyl group may be an aminoacid residue derived from one of the one of the 20 naturally occurring amino acids or the optically active isomers thereof, or the racemic mixtures thereof wherein the amino residue is derived from alanine, arginine, asparagine, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, or valine; or,

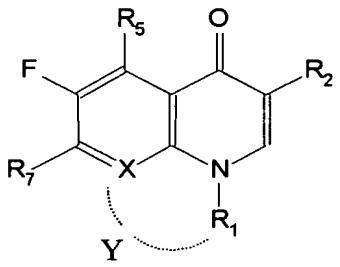
A is $C_6H_{11}O_6$, SO_3H, or PO_3H_2,

R_{11} is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, or heterocyclic group,

X is CH, C-F, C-Cl, C-CH_3, C-CF_3, C-OCH_3, C-$OCHF_2$, C-OCF_3, N or when X is equal to C, the nitrogen atom to which R_1 is linked forms an optionally substituted 5-membered ring, 6-membered ring, 7-membered ring, with X of the adjacent ring, the ring containing carbon atoms and optionally one or more Y atoms wherein the one or more Y atoms are the same or different and are selected from NH, O or S; if the ring is substituted, the substituent is C_{1-6} alkyl group;

and their pharmaceutically acceptable salts, hydrates, polymorphs and pseudopolymorphs.

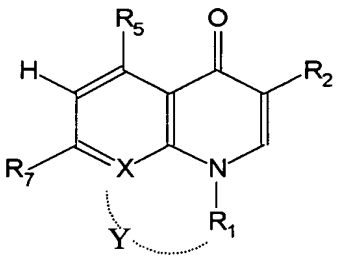
70. The method of claim 69 wherein said efflux pump inhibitor has structure 2



Structure 2

wherein R_1, R_2, R_5, R_7, X and Y are as defined in claim 69.

71. A method according to claim 69 wherein the efflux pump inhibitor has structure 3



Structure 3

wherein R_1, R_2, R_5, R_7, X and Y are as defined in claim 69.

72. The method of any one of claims 69 to 71, wherein said efflux pump is a Mef A or MefE pump.

73. The method of any one of claims 69 to 71, wherein said efflux pump is a NorA, Bmr, PmrA, QacA or QcaB pump.

74. The method of any one of claims 69 to 71, wherein said microbe expressing an efflux pump is a Gram negative organism-bearing MexAB-OprM, MexCD-OprJ, MexEF-OprM, MexXY-OprM, ARcrAB-TolC, AcrEF, MarA, SoxS, or/and Tet pump/s.

75. The method of any one of claims 59, 62, 66 or 69, wherein said microbe is a bacterium.

76. The method of claim 75, wherein said bacterium is selected from the group consisting of *Pseudomonas aeruginosa, Pseudomonas fluorescens, Pseudomonas acidovorans, Pseudomonas alcaligenes, Pseudomonas putida, Stenotrophomonas maltophilia, Burkholderia cepacia, Burkholderia pseudomallei, Aeromonas hydrophilia, Escherichia coli, Citrobacter freundii, Salmonella typhimurium, Salmonella enterica Serovar typhimurium, Salmonella typhi, Salmonella paratyphi, Salmonella enteritidis, Shigella dysenteriae, Shigella flexneri, Shigella sonnei, Enterobacter cloacae, Enterobacter aerogenes, Klebsiella pneumoniae, Klebsiella oxytoca, Serratia marcescens, Francisella tularensis, Morganella morganii, Proteus mirabilis, Proteus vulgaris, Providencia alcalifaciens, Providencia rettgeri, Providencia stuartii, Acinetobacter calcoaceticus, Acinetobacter haemolyticus, Yersinia enterocolitica, Yersinia pestis, Yersinia pseudotuberculosis, Yersinia intermedia, Bordetella pertussis, Bordetella parapertussis, Bordetella bronchiseptica, Haemophilus influenzae, Haemophilus parainfluenzae, Haemophilus haemolyticus, Haemophilus parahaemolyticus, Haemophilus ducreyi, Pasteurella multocida, Pasteurella haemolytica, Branhamella catarrhalis, Helicobacter pylori, Campylobacter fetus, Campylobacter jejuni, Campylobacter coli, Borrelia burgdorferi, Vibrio cholerae, Vibrio parahaemolyticus, Legionella pneumophila, Listeria monocytogenes, Neisseria gonorrhoeae, Neisseria meningitidis, Gardnerella vaginalis, Bacteroides fragilis, Bacteroides distasonis, Bacteroides 3452A homology group, Bacteroides vulgatus, Bacteroides ovalus, Bacteroides thetaiotaomicron, Bacteroides uniformis, Bacteroides eggerthii, Bacteroides splanchnicus, Clostridium difficile,*

Mycobacterium tuberculosis, Mycobacterium avium, Mycobacterium intracellulare, Mycobacterium leprae, Corynebacterium diphtheriae, Corynebacterium ulcerans, Streptococcus pneumoniae, Streptococcus agalactiae, Streptococcus pyogenes, Enterococcus faecalis, Enterococcus faecium and Staphylococcus aureus, Staphylococcus epidermidis, Staphylococcus saprophyticus, Staphylococcus intermedius, Staphylococcus hyicus subsp. hyicus, Staphylococcus haemolyticus, Staphylococcus hominis, and *Staphylococcus saccharolyticus,* and *Rickettsia prowazsekii.*

77. The method of claim 76, wherein said bacterium is selected from the group consisting of *Streptococcus pneumoniae, Streptococcus pyogenes, Pseudomonas aeruginosa, Escherischia coli,* and *Staphylococcus aureus.*

78. The method of any one of claims 59 to 64 or 66 to 71 wherein said microbial infection is a bacterial infection and said antimicrobial agent is an antibacterial agent.

79. The method of claim 78, wherein said antibacterial agent is a quinolone.

80. The method of claim 78, wherein said antibacterial agent is a tetracycline.

81. The method of claim 78, wherein said antibacterial agent is a beta-lactam.

82. The method of claim 78, wherein said antibacterial agent is a coumermycin.

83. The method of claim 78, wherein said antibacterial agent is chloramphenicol.

84. The method of claim 78, wherein said antibacterial agent is a glycopeptide.

85. The method of claim 78, wherein said antibacterial agent is an aminoglycoside.

86. The method of claim 78, wherein said antibacterial agent is a macrolide.

87. The method of claim 78, wherein said antibacterial agent is a rifamycin.

88. The method of claim 78, wherein said antibacterial agent is an oxazolidonone.

89. The method according to claim 65 wherein said microbial infection is a bacterial infection and said antimicrobial agent is an antibacterial agent.

90. The method of claim 89, wherein said antibacterial agent is a quinolone.

91. The method of claim 89, wherein said antibacterial agent is a tetracycline.

92. The method of claim 89, wherein said antibacterial agent is a beta-lactam.

93. The method of claim 89, wherein said antibacterial agent is a coumermycin.

94. The method of claim 89, wherein said antibacterial agent is chloramphenicol.

95. The method of claim 89, wherein said antibacterial agent is a glycopeptide.

96. The method of claim 89, wherein said antibacterial agent is an aminoglycoside.

97. The method of claim 89, wherein said antibacterial agent is a macrolide.

98. The method of claim 89, wherein said antibacterial agent is a rifamycin.

99. The method of claim 89, wherein said antibacterial agent is an oxazolidonone.

100. The method according to claim 72 wherein said microbial infection is a bacterial infection and said antimicrobial agent is an antibacterial agent.

101. The method of claim 100, wherein said antibacterial agent is a quinolone.

102. The method of claim 100, wherein said antibacterial agent is a tetracycline.

103. The method of claim 100, wherein said antibacterial agent is a beta-lactam.

104. The method of claim 100, wherein said antibacterial agent is a coumermycin.

105. The method of claim 100, wherein said antibacterial agent is chloramphenicol.

106. The method of claim 100, wherein said antibacterial agent is a glycopeptide.

107. The method of claim 100, wherein said antibacterial agent is an aminoglycoside.

108. The method of claim 100, wherein said antibacterial agent is a macrolide.

109. The method of claim 100, wherein said antibacterial agent is a rifamycin.

110. The method of claim 100, wherein said antibacterial agent is an oxazolidonone.

111. The method according to claim 73 wherein said microbial infection is a bacterial infection and said antimicrobial agent is an antibacterial agent.

112. The method of claim 111, wherein said antibacterial agent is a quinolone.

113. The method of claim 111, wherein said antibacterial agent is a tetracycline.

114. The method of claim 111, wherein said antibacterial agent is a beta-lactam.

115. The method of claim 111, wherein said antibacterial agent is a coumermycin.

116. The method of claim 111, wherein said antibacterial agent is chloramphenicol.

117. The method of claim 111, wherein said antibacterial agent is a glycopeptide.

118. The method of claim 111, wherein said antibacterial agent is an aminoglycoside.

119. The method of claim 111, wherein said antibacterial agent is a macrolide.

120. The method of claim 111, wherein said antibacterial agent is a rifamycin.

121. The method of claim 111, wherein said antibacterial agent is an oxazolidonone.

122. The method according to claim 74 wherein said microbial infection is a bacterial infection and said antimicrobial agent is an antibacterial agent.

123. The method of claim 122, wherein said antibacterial agent is a quinolone.

124. The method of claim 122, wherein said antibacterial agent is a tetracycline.

125. The method of claim 122, wherein said antibacterial agent is a beta-lactam.

126. The method of claim 122, wherein said antibacterial agent is a coumermycin.

127. The method of claim 122, wherein said antibacterial agent is chloramphenicol.

128. The method of claim 122, wherein said antibacterial agent is a glycopeptide.

129. The method of claim 122, wherein said antibacterial agent is an aminoglycoside.

130. The method of claim 122, wherein said antibacterial agent is a macrolide.

131. The method of claim 122, wherein said antibacterial agent is a rifamycin.

132. The method of claim 122, wherein said antibacterial agent is an oxazolidonone.

133. The method according to claim 75 wherein said microbial infection is a bacterial infection and said antimicrobial agent is an antibacterial agent.

134. The method of claim 133, wherein said antibacterial agent is a quinolone.

135. The method of claim 133, wherein said antibacterial agent is a tetracycline.

136. The method of claim 133, wherein said antibacterial agent is a beta-lactam.

137. The method of claim 133, wherein said antibacterial agent is a coumermycin.

138. The method of claim 133, wherein said antibacterial agent is chloramphenicol.

139. The method of claim 133, wherein said antibacterial agent is a glycopeptide.

140. The method of claim 133, wherein said antibacterial agent is an aminoglycoside.

141. The method of claim 133, wherein said antibacterial agent is a macrolide.

142. The method of cláim 133, wherein said antibacterial agent is a rifamycin.

143. The method of claim 133, wherein said antibacterial agent is an oxazolidonone.

144. The method of claim 76, wherein said antibacterial agent is a quinolone.

145. The method of claim 76, wherein said antibacterial agent is a tetracycline.

146. The method of claim 76, wherein said antibacterial agent is a beta-lactam.

147. The method of claim 76, wherein said antibacterial agent is a coumermycin.

148. The method of claim 76, wherein said antibacterial agent is chloramphenicol.

149. The method of claim 76, wherein said antibacterial agent is a glycopeptide.

150. The method of claim 76, wherein said antibacterial agent is an aminoglycoside.

151. The method of claim 76, wherein said antibacterial agent is a macrolide.

152. The method of claim 76, wherein said antibacterial agent is a rifamycin.

153. The method of claim 76, wherein said antibacterial agent is an oxazolidonone.

154. The method of claim 77, wherein said antibacterial agent is a quinolone.

155. The method of claim 77, wherein said antibacterial agent is a tetracycline.

156. The method of claim 77, wherein said antibacterial agent is a beta-lactam.

157. The method of claim 77, wherein said antibacterial agent is a coumermycin.

158. The method of claim 77, wherein said antibacterial agent is chloramphenicol.

159. The method of claim 77, wherein said antibacterial agent is a glycopeptide.

160. The method of claim 77, wherein said antibacterial agent is an aminoglycoside.

161. The method of claim 77, wherein said antibacterial agent is a macrolide.

162. The method of claim 77, wherein said antibacterial agent is a rifamycin.

163. The method of claim 77, wherein said antibacterial agent is an oxazolidonone.

164. The method according to any one of claims 59, 62, 66 or 69 wherein the efflux pump inhibitor is selected from the group consisting of:

1-Cyclopropyl-6-fluoro-1, 4-dihydro-5-methyl- 7-(4′-methoxypiperidin -1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

7-Bromo-1-cyclopropyl-6-fluoro-5-methyl-1,4-dihydro-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4′-amino-3′-methylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4′-amino-3′-methyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-{3,3-dimethyl-4′-ethylamino piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4′-amino-3′-3′-dimethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4′-(dimethylamino)piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4′-hydroxy-4′-methylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(3′,3′-dimethyl-4′-hydroxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6,8-difluoro-5-methyl-1,4-dihydro-7-(3′-aminomethyl-4′-hydroxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(3′-aminomethyl-4′-hydroxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Ethyl-6,8-difluoro-1,4-dihydro-7-(3′-5′-dimethylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(4′-ethyl-3′-methylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3′-5′-dimethyl-4′-ethylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Ethyl-6, 8-difluoro-1, 4-dihydro -7-{(1∝,5∝,6∝)-6′-amino-3′-azabicyclo [3.1.0] hex-3′-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-(2′,4′-difluorophenyl)-6,8-difluoro-1,4-dihydro-7-(3′-aminopyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-{(3′-amimoethoxycarbonyl pyrrolidin-3-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(pyrrolidin-3′-ylamino)-4-oxo-naphthyridine-3-carboxylic acid and its salts;

1-(2′,4′-Difluorophenyl)-6-fluoro-1,4-dihydro-7-(piperidin-4′-ylamino)-4-oxo-naphthyridine-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro -7-(4′-amino-3′-ethylpiperidin-1-yl)-4-oxo-naphthyridine-3-carboxylic acid and its salts;

(S)-(-)-9-Fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid 0.2 hydrate;

(S)-(-)-9-Fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid, choline salt;

(S)-(-)-9-Fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid. 1-Hydroxyethylpyrrolidine salt.

(S)-(-)-9-Fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid, Diethanolamine salt;

(S)-(-)-9-Fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate. L-histidine salt;

(RS)-(±)-9-Fluoro-6,7-dihydro-8-{4′-(D-phenylalanyloxy) piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

(RS)-(±)-9-Fluoro-6,7-dihydro-8-{4′-(L-α-aspartyloxy) piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

(±)-9-Fluoro-6,7-dihydro-8-{4′-(L-leucyloxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid dihydrochloride;

(-)-9-Fluoro-6,7-dihydro-8-{4′-(D-leucyloxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

(S)-(-)-9-Fluoro-6,7-dihydro-8-{4′-(L-alanyloxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

(S)-(-)-Morpholinoethyl-9-fluoro-6.7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate and its salts;

(R)-(+)-8,9-difluoro-6,7-dihydro-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2- [S-phenylalanyl-S-lysine methyl ester]carboxamide;

(RS)-(±)-9-Fluoro-6,7-dihydro-8-(trans-4′-hydroxy-3′-methylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

(RS)-(±)-9-Fluoro-6,7-dihydro-8-(cis-4′-hydroxy-3′-methylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

(S)-(-)-9-Fluoro-6,7-dihydro-8-(trans-4′-hydroxy-3′-methylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

7H-Pyrido[1,2,3-de]-1,4-benzoxazine-9-fluoro-2,3-dihydro-3-methyl-10-(4′-hydroxy-3′-ethylpiperidin-1′-yl)-7-oxo-6-carboxylic acid and its salts; and

10-Fluoro-11-[(1∝,5∝,6∝)-6-amino-3-azabicyclo[3.1.0]hex-3-yl]-3,4-dihydro-4(S)-methyl-8-oxo-2H,8H-pyrido[1,2,3-ef]-1,5-benzoxazepine-7-carboxylic acid. Hydrochloride.

165.The method according to any one of claims 59, 62, 66 or 69 wherein the efflux pump inhibitor is selected from the group consisting of:

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4′-amino-3′-methyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4′-(methylamino)-3′,3′-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

i-Propyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(4'-amino-3′,3'-dimethyl-piperidin-1-yl}-4-oxo-quinoline-3-carboxylate and its salts;

n-Butyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(4'-amino-3′,3'-dimethyl-piperidin-1-yl}-4-oxo-quinoline-3-carboxylate and its salts;

Ethoxycarbonylmethyl 1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4′-amino-3′,3′-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

Benzyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-{4′-(t-butoxycarbonyl amino)-3′,3′-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4′-N-(t-butoxycarbonyl-L-alanyl) amino-3′,3′-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4′-L-alanylamino-3′,3′-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(3′,3′-dimethyl-4′-(t-butoxy-carbonylvalinylamino)piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(3′,3′-dimethyl-4'-(L)-valyl-aminopiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4'-(L)-aspartylamino-3′,3'-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Ethyl-6,8-difluoro-1,4-dihydro-7-(4′-ethylaminopiperidin-1′-yl)-4-oxo- quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(4′-amino-3′-methyl piperidin -1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(quinuclidinyl-3-yl-amino)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro-7- {(1∝,5∝,6∝)-6-amino-N-benzyl-3-azabicyclo [3.1.0] hex-6-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-(3′-Fluorophenyl)-6-fluoro -1, 4-dihydro -7-(4′-methylpiperazin-1′-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-(2,4-Difluorophenyl) -6-fluoro-1, 4-dihydro-7- (4′-ethylaminopiperidin-1′-yl)- 4-oxo-quinoline-3-carboxylic acid and its salts;

1-(2′,4′-Difluorophenyl)-6-fluoro-5-methyl-1, 4-dihydro -7-(4′-aminopiperidin-1′-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-(2′,4′-Difluorophenyl)-6-fluoro-5-methyl-1,4-dihydro-7-(4′-methylamino piperidin-1′-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3′-aminopyrrolidin-1′-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-{(1∝,5∝,6∝)-6-amino--N-benzyl-3-azabicyclo [3.1.0] hex-6-yl}-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

1-(2,4-Difluorophenyl) -6-fluoro-1, 4-dihydro-7-(3′-aminopyrrolidin-1′-yl)- 4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

1-(2,4-Difluorophenyl) -6-fluoro-1, 4-dihydro-7-{(1∝,5∝,6∝)-6-amino-N-benzyl-3-azabicyclo [3.1.0]hex-6-yl}- 4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

1-(2,4-Difluorophenyl)-6-fluoro-1,4-dihydro-7-(3′,3′-dimethyl-4′-hydroxy piperdin-1′-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

(RS)-(±)-9-Fluoro-6, 7-dihydro-8-{4′-(L-α-aspartyloxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

7H-Pyrido[1,2,3-de]-1,4-benzoxazine-9-fluoro-2,3-dihydro-3-methyl-10-(3′-ethyl 4′-hydroxypiperidin-1′-yl)-7-oxo-6-carboxylic acid and its salts;

7H-Pyrido[1,2,3-de]-1,4-benzoxazine-9-fluoro-2, 3-dihydro-3-methyl-10- (3′-amino methyl-4′-hydroxypiperidin-1′-yl)-7-oxo-6-carboxylic acid and its salt;

1-Cyclopropyl-6, 8-difluoro-5-methyl-1, 4-dihydro -7-(3′, 3′-dimethyl-4′-ethylamino piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salt;

1-cyclopropyl-6,7,8-trifluoro-5-methyl-1,4-dihydro - 4-oxo-quinoline-3-carboxylic acid.

(S)-(-)-9-Fluoro-6,7-dihydro-8- (3′, 3′-dimethyl-4′-ethylaminopiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro-7- (3′-aminomethyl-4′-hydroxypiperidin 1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro-7- (4′-dimethylamino-3′-methylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4′-cyclopropyl aminopiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4'-(t-butoxycarbonyl (L)-Ala-Ala)amino-3′, 3'-dimethyl piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4′-ethylamino-3′, 5′-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

Ethyl 1-(2,4-difluorophenyl) -6-fluoro -1, 4-dihydro-7- (4-amino-3-ethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylate;

1-(2,4-difluorophenyl) -6-fluoro-1, 4-dihydro-7- (4-amino-3, 5-dimethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

Ethyl 1-(2,4-difluorophenyl) -6-fluoro-5-methyl-1, 4-dihydro-7- (4-amino-3, 3-dimethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylate;

(S)-(-)-9-fluoro-6.7-dihydro-8- (4′-hydroxy- 3′-fluoropiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

10-Fluoro-11- (4-aminopiperidin-1-yl)-3,4-dihydro-4 (S)-methyl-8-oxo-2H, 8H-pyrido[1,2,3-ef]-1,5-benzoxazipin-7-carboxylic acid and its salt;

(RS)-(±)-6, 7-dihydro-8- (trans-4′-hydroxy-3′-methylpiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

(RS)-(±)-6, 7-dihydro-8- (cis-4′-hydroxy-3′-methylpiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts; and

(RS)-(±)-6, 7-dihydro-8- (4′-hydroxy-3′, 3′-dimethylpiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts.

166.The method according to any one of claims 59, 62, 66 or 69 wherein the efflux pump inhibitor is selected from the group consisting of:

1-Ethyl-6-fluoro-1, 4-dihydro -7-(1′, 2′,3′,4′-tetrahydroisoquinolin-2-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Ethyl-6, 8-fluoro-1, 4-dihydro -7-(4′-acetoxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Ethyl-6, 8-fluoro-1, 4-dihydro -7-(4′-{2′-(2′-oxazolidin-1-yl) ethyl} piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1- Ethyl-6, 8-difluoro-1, 4-dihydro -7-{(1∝,5∝,6∝)-6-amino-3-azabicyclo [3.1.0]-hex-3-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- ethyl -6, 8-difluoro-1, 4-dihydro -7-(3′-amino-5′-methyl pyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- ethyl-6, 8-difluoro-1, 4-dihydro -7-(4′-aminopiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- ethyl -6, 8-difluoro-1, 4-dihydro -7-{4′-(acetamido) piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- ethyl-6, 8-difluoro-1, 4-dihydro -7-{(1∝,5∝,6∝)-6′-(t-butoxycarbonyl amino)-3-azabicyclo [3.1.0]-hex-3-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro-7-(3′-acetamido-5′-methylpyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro-7-(3′-amino-5′-methylpyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro--7-(4′-acetoxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro -7-{4′-(dimethylamino) piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3′,5′-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro -7-(4′-hydroxy-3′,5′-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro- -7-(3′, 4′, 5′-trimethyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro- 7-(3′, 5′-dimethyl-4′-ethyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro-5-methyl- 7-(4′-ethoxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro-5-methyl- 7-(3′, 3′-dimethylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4′-(dimethylamino)-3′-methyl piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4′-hydroxy-3′-isobutyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4′-hydroxy-3′,3′-dimethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4′-hydroxy-3′,5′-dimethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(3′-methylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(cis-4′-amino-3′,5′-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6,8-difluoro-5-methyl-1,4-dihydro-7-(4′-hydroxy-3′-aminomethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(5′amino-2′-methyl-pyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{3′-(L-Ala-L-Ala) amino pyrrolidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{4′-(di-n-butylamino) piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{4′-(t-butoxycarbonyl-L-Ala-L-Ala)aminopiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(4′- propionoxy piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(4′-hydroxy-3′,3′-dimethyl-piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1, 4-dihydro -7-{4′-(1-pyrrolidinyl) piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-{4′-[(piperidin-4-yl) aminomethyl]-piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{(1,2′,2′, 6′,6′-pentamethyl piperidin-4-yl)methylamino}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1, 4-dihydro -7-(3′,5′-dimethyl morpholin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(4′-cyclopropyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(3′, 5′-dimethyl-4-pivaloyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

Ethyl 6,8-Difluoro-7-(4-hydroxypiperidin-1-yl)-1-(1-phenylthio-3(*S*)-but-3-yl)-1,4-dihydro-4-oxo-quinoline-3-carboxylate;

1- (2′-Trifluoromethylphenyl) -6-fluoro-1, 4-dihydro- -7-(3′, 3', 4′-trimethyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- (2′-trifluoromethylphenyl)-6,8-difluoro-1, 4-dihydro -7-(morpholin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- (2′-trifluoromethylphenyl) -6, 8-difluoro-1, 4-dihydro -7-(3′,5′-dimethylmorpholin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- (2′-trifluoromethylphenyl) -6, 8-difluoro-1, 4-dihydro -7-(3′,5′-dimethyl piperazinyl-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- (4′-trifluoromethylphenyl) -6, 8-difluoro-1, 4-dihydro -7-(3′-aminopyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1- (4′-Fluorophenyl) -6-fluoro-1,4-dihydro -7-{4′-ethylamino)piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1- (2′,4′-Difluorophenyl) -6-fluoro-1, 4-dihydro-7-(3′, 5′-dimethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- (2′,4′-difluorophenyl) -6, 8-difluoro-1, 4-dihydro -7-(3′-hydroxy-5′-methylpyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- (2′,4′-difluorophenyl) -6, 8-difluoro-1, 4-dihydro -7-(3′,3′-dimethyl piperazinyl-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro -7-{(3′-aminoethoxycarbonyl)pyrrolidin-3-yl}-4-oxo-naphthyridine-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(pyrrolidin-3-yl-amino)-4-oxo-naphthyridine-3-carboxylic acid and its salts;

1- (2′,4′-Difluorophenyl) -6-fluoro-1, 4-dihydro -7-(piperidin-4-yl-amino)-4-oxo-naphthyridine-3-carboxylic acid and its salts;

Ethyl-1- (2′,4′-difluorophenyl) -6-fluoro-1, 4-dihydro -7-{[1∝,5∝,6∝]-3-N-benzyl-3-azabicyclo[3.1.0]hex-6-yl-amino}-4-oxo-naphthyridine-3-carboxylate and its salts;

1-(2,4-difluorophenyl) -6-fluoro-7-(1-phenyl-4,5,6,7-tetrahydropyrazolo [4,3-c]pyridin-1-yl-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid and is salts;

(S)-(-)-9-Fluoro-6,7-dihydro-8-(4′-carboxamidopiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

(R)-(+)-9-Fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid L-arginine salt;

(S)-(-)-9-Fluoro-6,7-dihydro-8-(4′-hydroxy-3′,3′-dimethylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

(S)-(-)-N-methylpiperidin-1-yl-9-fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate;

(S)-(-)-Morpholinoethyl-9-fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate and its salts;

Ethoxycarbonylmethyl (R)-(+)- 9-fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate;

N-1-{7-(1-cyclopropyl-6-fluoro-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-N-3-amino-{7-(1-(2,4-difluorophenyl)-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid)}-pyrrolidine;

N-1-{7-(1-cyclopropyl) -6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid)}-N-3-amino-{7-(1-cyclopropyl) -6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid)}-pyrrolidine;

N-1-{7-(1-cyclopropyl) -6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid)}-N-3-amino-{7-(1-cyclopropyl –6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-pyrrolidine;

N-1-{7-(1-cyclopropyl-6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid)}-N-4-{7-(1-cyclopropyl–6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-piperazine;

N-1-{7-(1-cyclopropyl-6-fluoro-5-methyl-1,4-dihydro-4-oxo-quinolone-3-carboxylic acid)}-N-3-amino-{7-(1-(2,4-difluorophenyl) -6-fluoro- 1, 4-dihydro-4-oxo-1, 8-naphthyridine-3-carboxylic acid)}-pyrrolidine;

N-1- {7-(1-cyclopropyl-6-fluoro-5-methyl-1, 4-dihydro-4-oxo-quinolone-3-carboxylic acid)}-N-4-amino {7-(1-cyclopropyl-6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-piperidine;

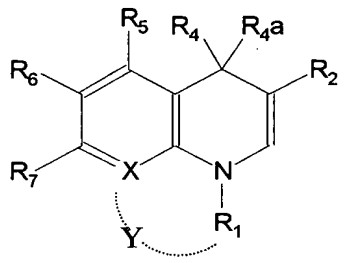
N-1- {7-(1-cyclopropyl-6-fluoro-5-methyl-1, 4-dihydro-4-oxo-quinolone-3-carboxylic acid)}-N-3-amino{7-(1-cyclopropyl-6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-pyrrolidine;

N-1- {7-(1-(2,4-difluorophenyl) -6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid)}-N-4- {7-(1-cyclopropyl-6-fluoro-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-piperazine;

N-3-azabycyclo{7-(1-(2,4-difluorophenyl)-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid)}-[1∝,5∝,6∝]-N-6-amino-{7-1-(2,4-difluorophenyl)-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid)}-[3.1.0] hexane; or

N-1- {7-(1-cyclopropyl-6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinolone-3-carboxylic acid)}-N-4-amino-{ethyl 2,3,6-trifluorophenyl-4-carboxylate}-piperidine.

167. An efflux inhibitor compound, wherein said compound has the chemical structure I below:



Structure I

wherein,

R_1 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, or optionally substituted aryl, aralkyl, arylaminoalkyl,

aryloxyalkyl,

arylS(O)$_t$alkyl, where t is 0, 1 or 2;

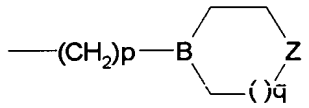
R_2 is H, CHO, $COOR_3$, or $CONHR_{13}$,

where R_{13} is H or the NHR_{13} of $CONHR_{13}$ is the residue of one of the 20 naturally occurring amino acids: alanine, arginine, asparagines, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine,

phenylalanine, proline, serine, threonine, tryptophan, tyrosine, valine or the optically active isomers thereof or the racemic mixtures thereof, or combinations of these amino acids to give dipeptidyl, tripeptidyl or polypeptidyl residues;

R_3 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, aryl, aralkyl, arylaminoalkyl, aryloxyalkyl, arylS(O)$_t$alkyl, where t is 0, 1 or 2; or R^3 is $(CH_2)_nCH(R_{14})OC(=O)R_{15}$, $(CH_2)_nCH(R_{14})C(=O)OR_{15}$ wherein n is 0-6, R_{14} is H or CH_3;

and R_{15} is C_2H_5 or $C(CH_3)_3$;

or R_3 is 

wherein B is CH or N, and when B is CH, Z is NH or NCH_3, and when B is N, Z is CH, O, NH, S or NCH_3, p=0-2 and q=0-2;

R_4 = H, R_{4a} = H, or R_4 and R_{4a} taken together are oxo (=O), or thio (=S);

R_5 = H, C_{1-5} alkyl, amino, alkylamino, or acylamino;

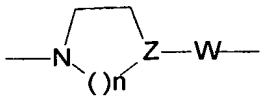
R_6 is (C_3-C_6) alkyl, Cl, F or amino;

R_7 is OH, halo or

NR_9R_{10} wherein R_9 and R_{10} are the same or different and represent H, C_{1-6} alkyl or $(CH_2)_nOA$,

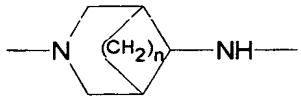
or R_9 is H and R_{10} is a 4-membered, 5-membered, 6-membered, or 7-membered carbocyclic, mono or bicyclic ring or mono or bicyclic heterocyclic ring linked to the nitrogen of NR_9R_{10} through an atom of the heterocycle other than the heterocyclic atom or R_9 and R_{10} taken together with the nitrogen atom to which they are attached form part of a heterocycle which heterocycle is monocyclic or bicyclic, and said carbocycle or heterocycle is optionally substituted;

or R_7 is $NHOA$, $NHCOOR_{11}$, or $NH(CH_2)_nNR_9R_{10}$;

or R_7 is  where n is 1, 2 or 3, Z is CH or N, and when Z is CH, W is NH

or

when Z is N, W is absent;

or  where n is 0, 1, or 2

wherein the R_7 moiety is linked either to 2 core molecules of the Formula I to form a bis compound or the R_7 moiety has one of its link bonds linked to the core formula of Formula I and the second of its link bonds is linked to an optionally substituted phenyl carboxylic acid or ester moiety thereof,

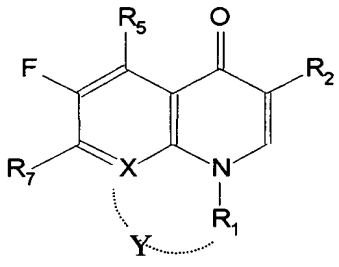
A is H, C_{1-6} alkyl, glycosyl, aralkyl, C_{1-6} alkanoyl or aminoalkanoyl wherein the aminoalkanoyl group may be an aminoacid residue derived from one of the one of the 20 naturally occurring amino acids or the optically active isomers thereof, or the racemic mixtures thereof wherein the amino residue is derived from alanine, arginine, asparagine, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, or valine; or,

A is $C_6H_{11}O_6$, SO_3H, or PO_3H_2,

R_{11} is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, or heterocyclic group,

X is CH, C-F, C-Cl, C-CH_3, C-CF_3, C-OCH_3, C-$OCHF_2$, C-OCF_3, N or when X is equal to C, the nitrogen atom to which R_1 is linked forms an optionally substituted 5-membered ring, 6-membered ring, 7-membered ring, with X of the adjacent ring, the ring containing carbon atoms and optionally one or more Y atoms wherein the one or more Y atoms are the same or different and are selected from NH, O or S; if the ring is substituted, the substituent is C_{1-6} alkyl group; and its pharmaceutically acceptable salts, hydrates, polymorphs and pseudopolymorphs.

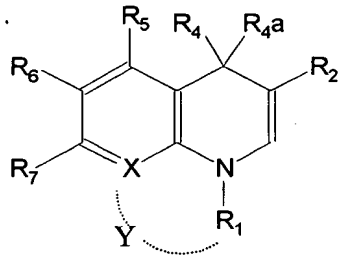
168. An efflux inhibitor compound according to claim 167, wherein said compound has the chemical structure 2 below



Structure 2

wherein R_1, R_2, R_5, R_7, X and Y are as defined in claim 167.

169. An efflux pump inhibitor of the Mef pump wherein said efflux pump inhibitor has the Structure I below



Structure I

wherein,

R_1 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, or optionally substituted aryl, aralkyl, arylaminoalkyl,

aryloxyalkyl,

arylS(O)$_t$alkyl, where t is 0, 1 or 2;

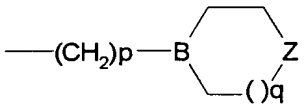
R_2 is H, CHO, $COOR_3$, or $CONHR_{13}$,

where R_{13} is H or the NHR_{13} of $CONHR_{13}$ is the residue of one of the 20 naturally occurring amino acids: alanine, arginine, asparagines, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, valine or the optically active isomers thereof or the racemic mixtures thereof, or combinations of these amino acids to give dipeptidyl, tripeptidyl or polypeptidyl residues;

R_3 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, aryl, aralkyl, arylaminoalkyl, aryloxyalkyl, arylS(O)$_t$alkyl, where t is 0, 1 or 2; or R^3 is

$(CH_2)_nCH(R_{14})OC(=O)R_{15}$, $(CH_2)_nCH(R_{14})C(=O)OR_{15}$ wherein n = 0-6, R_{14} = H or CH_3;

and $R_{15} = C_2H_5$ or $C(CH_3)_3$;

or R_3 is 

wherein B is CH or N, and when B is CH, Z is NH or NCH_3, and when B is N, Z is CH, O, NH, S or NCH_3, p is 0-2 and q is 0-2;

R_4 is H, R_{4a} is H, or R_4 and R_{4a} taken together are oxo (=O), or thio (=S);

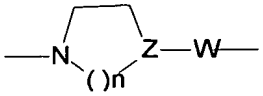
R_5 is H, C_{1-5} alkyl, amino, alkylamino, or acylamino;

R_6 is H, C_{3-6} alkyl, F, Cl or amino;

R_7 is OH, halo or NR_9R_{10} wherein R_9 and R_{10} are the same or different and represent H, C_{1-6} alkyl or $(CH_2)_nOA$,

or R_9 is H and R_{10} is a 4-membered, 5-membered, 6-membered, or 7-membered carbocyclic, mono or bicyclic ring or mono or bicyclic heterocyclic ring linked to the nitrogen of NR_9R_{10} through an atom of the heterocycle other than the heterocyclic atom or R_9 and R_{10} taken together with the nitrogen atom to which they are attached form part of a heterocycle which heterocycle is monocyclic or bicyclic, and said carbocycle and heterocycle is optionally substituted;

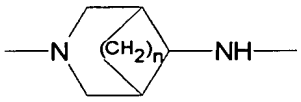
or R_7 is NHOA, $NHCOOR_{11}$, or $NH(CH_2)_nNR_9R_{10}$;

or R_7 is 

where n is 1, 2 or 3, Z is CH or N, and when Z is CH, W is NH

or

when Z is N, W is absent;

or  where n is 0, 1, or 2

wherein the R_7 moiety is linked either to 2 core molecules of the Formula I to form a bis compound or the R_7 moiety has one of its link bonds linked to the core formula of Formula I and the second of its link bonds is linked to an optionally substituted phenyl carboxylic acid or ester moiety thereof,

A is H, C_{1-6} alkyl, glycosyl, aralkyl, C_{1-6} alkanoyl or aminoalkanoyl wherein the aminoalkanoyl group may be an aminoacid residue derived from one of the one of the 20 naturally occurring amino acids or the optically active isomers thereof, or the racemic mixtures thereof wherein the amino residue is derived from alanine, arginine, asparagine, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, or valine; or

A is $C_6H_{11}O_6$, SO_3H, or PO_3H_2,

R_{11} is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, or heterocyclic group,

X is CH, C-F, C-Cl, C-CH_3, C-CF_3, C-OCH_3, C-$OCHF_2$, C-OCF_3, N or when X is equal to C, the nitrogen atom to which R_1 is linked forms an optionally substituted 5-membered

ring, 6-membered ring, 7-membered ring, with X of the adjacent ring, the ring containing carbon atoms and optionally one or more Y atoms wherein the one or more Y atoms are the same or different and are selected from NH, O or S; if the ring is substituted, the substituent is C_{1-6} alkyl group; and its pharmaceutically acceptable salts, hydrates, polymorphs and pseudopolymorphs.

170. The efflux pump inhibitor according to claim 169 selected from the group consisting of:

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4′-amino-3′-methyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4′-(methylamino)-3′,3′-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

i-Propyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(4'-amino-3′,3'-dimethyl-piperidin-1-yl}-4-oxo-quinoline-3-carboxylate and its salts;

n-Butyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(4'-amino-3′,3'-dimethyl-piperidin-1-yl}-4-oxo-quinoline-3-carboxylate and its salts;

Ethoxycarbonylmethyl 1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4′-amino-3′,3′-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

Benzyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-{4′-(t-butoxycarbonyl amino)-3′,3′-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4′-N-(t-butoxycarbonyl-L-alanyl) amino-3′,3′-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4′-L-alanylamino-3′,3′-dimethylpiperidin-1-)-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(3′,3′-dimethyl-4′-(t-butoxy-carbonylvalinylamino)piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(3′,3′-dimethyl-4'-(L)-valyl-aminopiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4'-(L)-aspartylamino-3′,3'-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Ethyl-6,8-difluoro-1,4-dihydro-7-(4′-ethylaminopiperidin-1′-yl)-4-oxo- quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(4′-amino-3′-methyl piperidin -1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(quinuclidinyl-3-yl-amino)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro-7- {(1∝,5∝,6∝)-6-amino-N-benzyl-3-azabicyclo [3.1.0] hex-6-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-(3′-Fluorophenyl)-6-fluoro -1, 4-dihydro -7-(4′-methylpiperazin-1′-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-(2,4-Difluorophenyl) -6-fluoro-1, 4-dihydro-7- (4′-ethylaminopiperidin-1′-yl)- 4-oxo-quinoline-3-carboxylic acid and its salts;

1-(2′,4′-Difluorophenyl)-6-fluoro-5-methyl-1, 4-dihydro -7-(4′-aminopiperidin-1′-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-(2′,4′-Difluorophenyl)-6-fluoro-5-methyl-1,4-dihydro-7-(4′-methylamino piperidin-1′-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3′-aminopyrrolidin-1′-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-{(1∝,5∝,6∝)-6-amino--N-benzyl-3-azabicyclo [3.1.0] hex-6-yl}-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

1-(2,4-Difluorophenyl) -6-fluoro-1, 4-dihydro-7-(3′-aminopyrrolidin-1′-yl)- 4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

1-(2,4-Difluorophenyl) -6-fluoro-1, 4-dihydro-7-{(1∝,5∝,6∝)-6-amino-N-benzyl-3-azabicyclo [3.1.0]hex-6-yl}- 4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

1-(2,4-Difluorophenyl)-6-fluoro-1,4-dihydro-7-(3′,3′-dimethyl-4′-hydroxy piperdin-1′-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

(RS)-(±)-9-Fluoro-6, 7-dihydro-8-{4′-(L-α-aspartyloxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

7H-Pyrido[1,2,3-de]-1,4-benzoxazine-9-fluoro-2,3-dihydro-3-methyl-10-(3′-ethyl 4′-hydroxypiperidin-1′-yl)-7-oxo-6-carboxylic acid and its salts;

7H-Pyrido[1,2,3-de]-1,4-benzoxazine-9-fluoro-2, 3-dihydro-3-methyl-10- (3′-amino methyl-4′-hydroxypiperidin-1′-yl)-7-oxo-6-carboxylic acid and its salt;

1-Cyclopropyl-6, 8-difluoro-5-methyl-1, 4-dihydro -7-(3′, 3′-dimethyl-4′-ethylamino piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salt;

1-Cyclopropyl-6,7,8-trifluoro-5-methyl-1,4-dihydro - 4-oxo-quinoline-3-carboxylic acid;

(S)-(-)-9-Fluoro-6,7-dihydro-8- (3′, 3′-dimethyl-4′-ethylaminopiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro-7- (3′-aminomethyl-4′-hydroxypiperidin 1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro-7- (4′-dimethylamino-3′-methylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4′-cyclopropyl aminopiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4'-(t-butoxycarbonyl (L)-Ala-Ala)amino-3′, 3'-dimethyl piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4′-ethylamino-3′, 5′-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

Ethyl 1-(2,4-difluorophenyl) -6-fluoro -1, 4-dihydro-7- (4-amino-3-ethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylate;

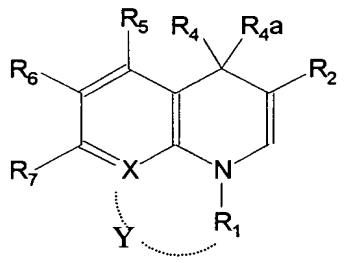
1-(2,4-difluorophenyl) -6-fluoro-1, 4-dihydro-7- (4-amino-3, 5-dimethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

Ethyl 1-(2,4-difluorophenyl) -6-fluoro-5-methyl-1, 4-dihydro-7- (4-amino-3, 3-dimethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylate;

(S)-(-)-9-fluoro-6.7-dihydro-8- (4′-hydroxy- 3′-fluoropiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts; and

10-Fluoro-11- (4-aminopiperidin-1-yl)-3,4-dihydro-4 (S)-methyl-8-oxo-2H, 8H-pyrido[1,2,3-ef]-1,5-benzoxazipin-7-carboxylic acid and its salt.

171. An efflux pump inhibitor of the NorA, Bmr, PmrA, QacA and/or QacB pump/s wherein said efflux pump inhibitor has the Structure I below



Structure I

wherein,

R_1 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, or optionally substituted aryl, aralkyl, arylaminoalkyl, aryloxyalkyl,

arylS(O)$_t$alkyl, where t is 0,1 or 2;

R_2 is H, CHO, $COOR_3$, or $CONHR_{13}$,

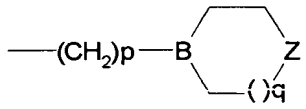
where R_{13} is H or the NHR_{13} of $CONHR_{13}$ is the residue of one of the 20 naturally occurring amino acids: alanine, arginine, asparagines, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, valine or the

optically active isomers thereof or the racemic mixtures thereof, or combinations of these amino acids to give dipeptidyl, tripeptidyl or polypeptidyl residues;

R_3 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, aryl, aralkyl, arylaminoalkyl, aryloxyalkyl, $arylS(O)_talkyl$, where t is 0, 1 or 2; or R^3 is

$(CH_2)_nCH(R_{14})$ $OC(=O)R_{15}$, $(CH_2)_nCH(R_{14})$ $C(=O)OR_{15}$ wherein n is 0-6, R_{14} is H or CH_3;

and R_{15} is C_2H_5 or $C(CH_3)_3$;

or R_3 is 

wherein B is CH or N, and when B is CH, Z is NH or NCH_3, and when B is N, Z is CH, O, NH, S or

NCH_3, p is 0-2 and q is 0-2;

R_4 is H, R_{4a} = H, or R_4 and R_{4a} taken together are oxo (=O), or thio (=S);

R_5 is H, C_{1-5} alkyl, amino, alkylamino, or acylamino;

R_6 is C_{3-6} alkyl, F, Cl or amino;

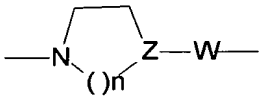
R_7 is OH, halo or NR_9 R_{10} wherein R_9 and R_{10} are the same or different and represent H, C_{1-6} alkyl or

$(CH_2)_nOA$,

or R_9 is H and R_{10} is a 4-membered, 5-membered, 6-membered, or 7-membered carbocyclic, mono or bicyclic ring or mono or bicyclic heterocyclic ring linked to the nitrogen of NR_9R_{10} through an atom of the heterocycle other than the heterocyclic atom or R_9 and R_{10} taken together with the nitrogen atom to which they are attached form part

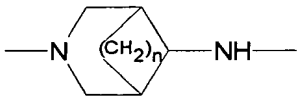
of a heterocycle which heterocycle is monocyclic or bicyclic, and said carbocycle or heterocycle is optionally substituted;

or R_7 is NHOA, $NHCOOR_{11}$, or $NH(CH_2)_nNR_9R_{10}$;

or R_7 is  where n is 1, 2 or 3, Z is CH or N, and when Z is CH, W is NH

or

when Z is N, W is absent;

or  where n is 0, 1, or 2

wherein the R_7 moiety is linked either to 2 core molecules of the Formula I to form a bis compound or the R_7 moiety has one of its link bonds linked to the core formula of Formula I and the second of its link bonds is linked to an optionally substituted phenyl carboxylic acid or ester moiety thereof,

A is H, C_{1-6} alkyl, glycosyl, aralkyl, C_{1-6} alkanoyl or aminoalkanoyl wherein the aminoalkanoyl group may be an aminoacid residue derived from one of the one of the 20 naturally occurring amino acids or the optically active isomers thereof, or the racemic mixtures thereof wherein the amino residue is derived from alanine, arginine, asparagine, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine,

lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, or valine; or,

A is $C_6H_{11}O_6$, SO_3H, or PO_3H_2,

R_{11} is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, or heterocyclic group,

X is CH, C-F, C-Cl, C-CH_3, C-CF_3, C-OCH_3, C-$OCHF_2$, C-OCF_3, N or when X is equal to C, the nitrogen atom to which R_1 is linked forms an optionally substituted 5-membered ring, 6-membered ring, 7-membered ring, with X of the adjacent ring, the ring containing carbon atoms and optionally one or more Y atoms wherein the one or more Y atoms are the same or different and are selected from NH, O or S; if the ring is substituted, the substituent is C_{1-6} alkyl group; and its pharmaceutically acceptable salts, hydrates, polymorphs and pseudopolymorphs.

172. The efflux pump inhibitor according to claim 171 selected from the group consisting of:

1-Ethyl-6-fluoro-1, 4-dihydro -7-(1′, 2′,3′,4′-tetrahydroisoquinolin-2-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Ethyl-6,8-fluoro-1, 4-dihydro -7-(4′-acetoxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Ethyl-6,8-fluoro-1, 4-dihydro -7-(4′-{2′-(2′-oxazolidin-1-yl) ethyl} piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1- Ethyl-6, 8-difluoro-1, 4-dihydro -7-{(1∝,5∝,6∝)-6-amino-3-azabicyclo [3.1.0]-hex-3-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- ethyl -6, 8-difluoro-1, 4-dihydro -7-(3′-amino-5′-methyl pyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- ethyl-6, 8-difluoro-1, 4-dihydro -7-(4′-aminopiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- ethyl -6, 8-difluoro-1, 4-dihydro -7-{4′-(acetamido) piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- ethyl-6, 8-difluoro-1, 4-dihydro -7-{(1∝,5∝,6∝)-6′-(t-butoxycarbonyl amino)-3-azabicyclo [3.1.0]-hex-3-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro-7-(3′-acetamido-5′-methylpyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro-7-(3′-amino-5′-methylpyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro--7-(4′-acetoxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro -7-{4′-(dimethylamino) piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3′,5′-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro -7-(4′-hydroxy-3′,5′-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro- -7-(3′, 4′, 5′-trimethyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro- 7-(3′, 5′-dimethyl-4′-ethyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro-5-methyl- 7-(4′-ethoxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro-5-methyl- 7-(3′, 3′-dimethylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4′-(dimethylamino)-3′-methyl piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4′-hydroxy-3′-isobutyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4′-hydroxy-3′,3′-dimethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4′-hydroxy-3′,5′-dimethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(3′-methylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(cis-4′-amino-3′,5′-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6,8-difluoro-5-methyl-1,4-dihydro-7-(4′-hydroxy-3′-aminomethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(5′amino-2′-methyl-pyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{3′-(L-Ala-L-Ala) amino pyrrolidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{4′-(di-n-butylamino) piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{4′-(t-butoxycarbonyl-L-Ala-L-Ala)aminopiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(4′- propionoxy piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(4′-hydroxy-3′,3′-dimethyl-piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1, 4-dihydro -7-{4′-(1-pyrrolidinyl) piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-{4′-[(piperidin-4-yl) aminomethyl]-piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{(1,2′,2′, 6′,6′-pentamethyl piperidin-4-yl)methylamino}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1, 4-dihydro -7-(3′,5′-dimethyl morpholin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(4′-cyclopropyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(3′, 5′-dimethyl-4-pivaloyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

Ethyl 6,8-Difluoro-7-(4-hydroxypiperidin-1-yl)-1-(1-phenylthio-3(*S*)-but-3-yl)-1,4-dihydro-4-oxo-quinoline-3-carboxylate;

1- (2′-Trifluoromethylphenyl) -6-fluoro-1, 4-dihydro- -7-(3′, 3’, 4′-trimethyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- (2′-trifluoromethylphenyl)-6,8-difluoro-1, 4-dihydro -7-(morpholin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- (2′-trifluoromethylphenyl) -6, 8-difluoro-1, 4-dihydro -7-(3′,5′-dimethylmorpholin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- (2′-trifluoromethylphenyl) -6, 8-difluoro-1, 4-dihydro -7-(3′,5′-dimethyl piperazinyl-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- (4′-trifluoromethylphenyl) -6, 8-difluoro-1, 4-dihydro -7-(3′-aminopyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1- (4′-Fluorophenyl) -6-fluoro-1,4-dihydro -7-{4′-ethylamino)piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1- (2′,4′-Difluorophenyl) -6-fluoro-1, 4-dihydro-7-(3′, 5′-dimethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- (2′,4′-difluorophenyl) -6, 8-difluoro-1, 4-dihydro -7-(3′-hydroxy-5′-methylpyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- (2′,4′-difluorophenyl) -6, 8-difluoro-1, 4-dihydro -7-(3′,3′-dimethyl piperazinyl-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro -7-{(3′-aminoethoxycarbonyl)pyrrolidin-3-yl}-4-oxo-naphthyridine-3-carboxylic acid and its salts

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(pyrrolidin-3-yl-amino)-4-oxo-naphthyridine-3-carboxylic acid and its salts;

1- (2′,4′-Difluorophenyl) -6-fluoro-1, 4-dihydro -7-(piperidin-4-yl-amino)-4-oxo-naphthyridine-3-carboxylic acid and its salts;

Ethyl-1- (2′,4′-difluorophenyl) -6-fluoro-1, 4-dihydro -7-{[1∝,5∝,6∝]-3-N-benzyl-3-azabicyclo[3.1.0]hex-6-yl-amino}-4-oxo-naphthyridine-3-carboxylate and its salts;

1-(2,4-difluorophenyl) -6-fluoro-7-(1-phenyl-4,5,6,7-tetrahydropyrazolo [4,3-c]pyridin-1-yl-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid and is salts;

(S)-(-)-9-Fluoro-6,7-dihydro-8-(4′-carboxamidopiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

(R)-(+)-9-Fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid L-arginine salt;

(S)-(-)-9-Fluoro-6,7-dihydro-8-(4′-hydroxy-3′,3′-dimethylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

(S)-(-)-N-methylpiperidin-1-yl-9-fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate;

(S)-(-)-Morpholinoethyl-9-fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate and its salts;

Ethoxycarbonylmethyl (R)-(+)- 9-fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate;

N-1-{7-(1-cyclopropyl-6-fluoro-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-N-3-amino-{7-(1-(2,4-difluorophenyl)-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid)}-pyrrolidine;

N-1-{7-(1-cyclopropyl) -6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid)}-N-3-amino-{7-(1-cyclopropyl) -6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid)}-pyrrolidine;

N-1-{7-(1-cyclopropyl) -6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid)}-N-3-amino-{7-(1-cyclopropyl –6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-pyrrolidine;

N-1-{7-(1-cyclopropyl-6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid)}-N-4-{7-(1-cyclopropyl–6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-piperazine;

N-1-{7-(1-cyclopropyl-6-fluoro-5-methyl-1,4-dihydro-4-oxo-quinolone-3-carboxylic acid)}-N-3-amino-{7-(1-(2,4-difluorophenyl) -6-fluoro- 1, 4-dihydro-4-oxo-1, 8-naphthyridine-3-carboxylic acid)}-pyrrolidine;

N-1- {7-(1-cyclopropyl-6-fluoro-5-methyl-1, 4-dihydro-4-oxo-quinolone-3-carboxylic acid)}-N-4-amino {7-(1-cyclopropyl-6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-piperidine;

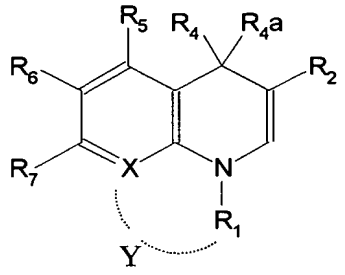
N-1- {7-(1-cyclopropyl-6-fluoro-5-methyl-1, 4-dihydro-4-oxo-quinolone-3-carboxylic acid)}-N-3-amino{7-(1-cyclopropyl-6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-pyrrolidine;

N-1- {7-(1-(2,4-difluorophenyl) -6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid)}-N-4- {7-(1-cyclopropyl-6-fluoro-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-piperazine;

N-3-azabycyclo{7-(1-(2,4-difluorophenyl)-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid)}-[1∝,5∝,6∝]-N-6-amino-{7-1-(2,4-difluorophenyl)-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid)}-[3.1.0] hexane; and

N-1- {7-(1-cyclopropyl-6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinolone-3-carboxylic acid)}-N-4-amino-{ethyl 2,3,6-trifluorophenyl-4-carboxylate}-piperidine.

173. An efflux pump inhibitor of the MexAB-OprM, MexCD-OprJ, MexEF-OprM, MexXY-OprM, AcrAB-TolC, AcrEF, MarA, SoxS and/or Tet pump/s, wherein said efflux pump inhibitor has the Structure I below



Structure I

wherein,

R_1 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, or optionally substituted aryl, aralkyl, arylaminoalkyl,

aryloxyalkyl,

arylS(O)$_t$alkyl, where t is 0,1 or 2;

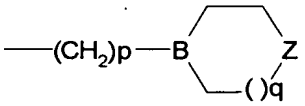
R_2 is H, CHO, $COOR_3$, or $CONHR_{13}$,

where R_{13} is H or the NHR_{13} of $CONHR_{13}$ is the residue of one of the 20 naturally occurring amino acids: alanine, arginine, asparagines, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, valine or the optically active isomers thereof or the racemic mixtures thereof, or combinations of these amino acids to give dipeptidyl, tripeptidyl or polypeptidyl residues;

R_3 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, aryl, aralkyl, arylaminoalkyl, aryloxyalkyl,

arylS(O)$_t$alkyl, where t is 0, 1 or 2; or R^3 is $(CH_2)_nCH(R_{14})$ $OC(=O)R_{15}$, $(CH_2)_nCH(R_{14})$ $C(=O)OR_{15}$ wherein n = 0-6, R_{14} = H or CH_3;

and R_{15} = C_2H_5 or $C(CH_3)_3$;

or R_3 is 

wherein B is CH or N, and when B is CH, Z is NH or NCH_3, and when B is N, Z is CH, O, NH, S or NCH_3, p is 0-2 and q is 0-2;

R_4 is H, R_{4a} is H, or R_4 and R_{4a} taken together are oxo (=O), or thio (=S);

R_5 is H, C_{1-5} alkyl, amino, alkylamino, or acylamino;

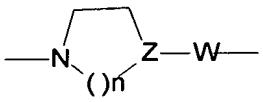
R_6 is C_{3-6} alkyl, F, Cl or amino;

R_7 is OH, halo or

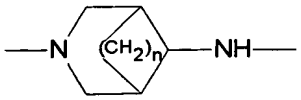
NR_9R_{10} wherein R_9 and R_{10} are the same or different and represent H, C_{1-6} alkyl or $(CH_2)_nOA$,

or R_9 is H and R_{10} is a 4-membered, 5-membered, 6-membered, or 7-membered carbocyclic, mono or bicyclic ring or mono or bicyclic heterocyclic ring linked to the nitrogen of NR_9R_{10} through an atom of the heterocycle other than the heterocyclic atom or R_9 and R_{10} taken together with the nitrogen atom to which they are attached form part of a heterocycle which heterocycle is monocyclic or bicyclic, and said carbocycle or heterocycle is optionally substituted;

or R_7 is NHOA, $NHCOOR_{11}$, or $NH(CH_2)_nNR_9R_{10}$;

or R_7 is  where n is 1, 2 or 3, Z is CH or N, and when Z is CH, W is NH or

when Z is N, W is absent;

or  where n is 0, 1, or 2

wherein the R_7 moiety is linked either to 2 core molecules of the Formula I to form a bis compound or the R_7 moiety has one of its link bonds linked to the core formula of Formula I and the second of its link bonds is linked to an optionally substituted phenyl carboxylic acid or ester moiety thereof,

A is H, C_{1-6} alkyl, glycosyl, aralkyl, C_{1-6} alkanoyl or aminoalkanoyl wherein the aminoalkanoyl group may be an aminoacid residue derived from one of the one of the 20 naturally occurring amino acids or the optically active isomers thereof, or the racemic mixtures thereof wherein the amino residue is derived from alanine, arginine, asparagine, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, or valine; or,

A is $C_6H_{11}O_6$, SO_3H, or PO_3H_2,

R_{11} is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, or heterocyclic group,

X is CH, C-F, C-Cl, C-CH_3, C-CF_3, C-OCH_3, C-$OCHF_2$, C-OCF_3, N or when X is equal to C, the nitrogen atom to which R_1 is linked forms an optionally substituted 5-membered ring, 6-membered ring, 7-membered ring, with X of the adjacent ring, the ring containing

carbon atoms and optionally one or more Y atoms wherein the one or more Y atoms are the same or different and are selected from NH, O or S; if the ring is substituted, the substituent is C_{1-6} alkyl group; and its pharmaceutically acceptable salts, hydrates, polymorphs and pseudopolymorphs.

174.The efflux pump inhibitor according to claim 173 selected from the group consisting of:

1-Cyclopropyl-6-fluoro-1, 4-dihydro-5-methyl- 7-(4′-methoxypiperidin -1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

7-Bromo-1-cyclopropyl-6-fluoro-5-methyl-1,4-dihydro-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4′-amino-3′-methylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4′-amino-3′-methyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-{3,3-dimethyl-4′-ethylamino piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4′-amino-3′-3′-dimethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4′-(dimethylamino)piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4′-hydroxy-4′-methylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(3′,3′-dimethyl-4′-hydroxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6,8-difluoro-5-methyl-1,4-dihydro-7-(3′-aminomethyl-4′-hydroxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(3′-aminomethyl-4′-hydroxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Ethyl-6,8-difluoro-1,4-dihydro-7-(3′-5′-dimethylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(4′-ethyl-3′-methylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3′-5′-dimethyl-4′-ethylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Ethyl-6, 8-difluoro-1, 4-dihydro -7-{(1∝,5∝,6∝)-6′-amino-3′-azabicyclo [3.1.0] hex-3′-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-(2′,4′-difluorophenyl)-6,8-difluoro-1,4-dihydro-7-(3′-aminopyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-{(3′-amimoethoxycarbonyl pyrrolidin-3-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(pyrrolidin-3′-ylamino)-4-oxo-naphthyridine-3-carboxylic acid and its salts;

1-(2′,4′-Difluorophenyl)-6-fluoro-1,4-dihydro-7-(piperidin-4′-ylamino)-4-oxo-naphthyridine-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro -7-(4′-amino-3′-ethylpiperidin-1-yl)-4-oxo-naphthyridine-3-carboxylic acid and its salts;

(S)-(-)-9-Fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid 0.2 hydrate;

(RS)-(±)-9-Fluoro-6,7-dihydro-8-{4′-(D-phenylalanyloxy) piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

(RS)-(±)-9-Fluoro-6,7-dihydro-8-{4′-(L-α-aspartyloxy) piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

(±)-9-Fluoro-6,7-dihydro-8-{4′-(L-leucyloxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid dihydrochloride;

(-)-9-Fluoro-6,7-dihydro-8-{4′-(D-leucyloxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

(S)-(-)-9-Fluoro-6,7-dihydro-8-{4′-(L-alanyloxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

(S)-(-)-Morpholinoethyl-9-fluoro-6.7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate and its salts;

(R)-(+)-8,9-difluoro-6,7-dihydro-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2- [S-phenylalanyl-S-lysine methyl ester]carboxamide;

(RS)-(±)-9-Fluoro-6,7-dihydro-8-(trans-4′-hydroxy-3′-methylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

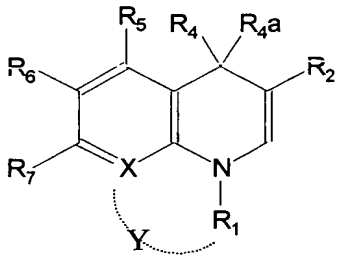
(RS)-(±)-9-Fluoro-6,7-dihydro-8-(cis-4′-hydroxy-3′-methylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

(S)-(-)-9-Fluoro-6,7-dihydro-8-(trans-4′-hydroxy-3′-methylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

7H-Pyrido[1,2,3-de]-1,4-benzoxazine-9-fluoro-2,3-dihydro-3-methyl-10-(4′-hydroxy-3′-ethylpiperidin-1′-yl)-7-oxo-6-carboxylic acid and its salts; and

10-Fluoro-11-[(1∝,5∝,6∝)-6-amino-3-azabicyclo[3.1.0]hex-3-yl]-3,4-dihydro-4(S)-methyl-8-oxo-2H,8H-pyrido[1,2,3-ef]-1,5-benzoxazepine-7-carboxylic acid, Hydrochloride.

175. A pharmaceutical composition effective for treatment of an infection by a microbe in an animal, comprising an efflux pump inhibitor and a pharmaceutically acceptable carrier, wherein said efflux pump inhibitor has the chemical structure of structure I below:



Structure I

wherein,

R_1 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, or optionally substituted aryl, aralkyl, arylaminoalkyl,

aryloxyalkyl,

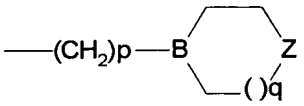
arylS(O)$_t$alkyl, where t is 0, 1 or 2,

R_2 is H, CHO, $COOR_3$, or $CONHR_{13}$,

where R_{13} is H or the NHR_{13} of $CONHR_{13}$ is the residue of one of the 20 naturally occurring amino acids: alanine, arginine, asparagines, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, valine or the

optically active isomers thereof or the racemic mixtures thereof, or combinations of these amino acids to give dipeptidyl, tripeptidyl or polypeptidyl residues;

R_3 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, aryl, aralkyl, arylaminoalkyl, aryloxyalkyl, aryl$S(O)_t$alkyl, where t is 0, 1 or 2; or R^3 is $(CH_2)_nCH(R_{14})$ $OC(=O)R_{15}$, $(CH_2)_nCH(R_{14})$ $C(=O)OR_{15}$ wherein n = 0-6, R_{14} = H or CH_3; and R_{15} = C_2H_5 or $C(CH_3)_3$;

or R_3 is 

wherein B is CH or N, and when B is CH, Z is NH or NCH_3, and when B is N, Z is CH, O, NH, S or

NCH_3, p is 0-2 and q is 0-2;

R_4 is H, R_{4a} is H, or R_4 and R_{4a} taken together are oxo (=O), or thio (=S);

R_5 is H, C_{1-5} alkyl, amino, alkylamino, or acylamino;

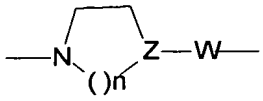
R_6 is H, C_{1-6} alkyl, halo ,amino, or hydroxy;

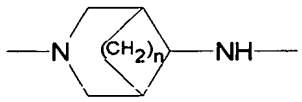
R_7 is OH, halo or

NR_9R_{10} wherein R_9 and R_{10} are the same or different and represent H, C_{1-6} alkyl or $(CH_2)_nOA$,

or R_9 is H and R_{10} is a 4-membered, 5-membered, 6-membered, or 7-membered carbocyclic, mono or bicyclic ring or mono or bicyclic heterocyclic ring linked to the nitrogen of NR_9R_{10} through an atom of the heterocycle other than the heterocyclic atom or R_9 and R_{10} taken together with the nitrogen atom to which they are attached form part of a heterocycle which heterocycle is monocyclic or bicyclic, and said carbocycle or heterocycle is optionally substituted;

or R_7 is $NHOA$, $NHCOOR_{11}$, or $NH(CH_2)_nNR_9R_{10}$;

or R_7 is  where n is 1, 2 or 3, Z is CH or N, and when Z is CH, W is NH or when Z is N, W is absent;

or  where n is 0, 1, or 2

wherein the R_7 moiety is linked either to 2 core molecules of the Formula I to form a bis compound or the R_7 moiety has one of its link bonds linked to the core formula of Formula I and the second of its link bonds is linked to an optionally substituted phenyl carboxylic acid or ester moiety thereof,

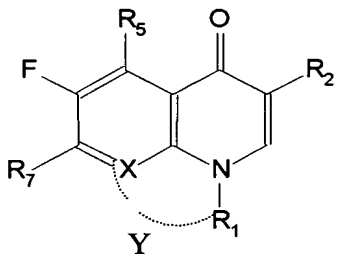
A is H, C_{1-6} alkyl, glycosyl, aralkyl, C_{1-6} alkanoyl or aminoalkanoyl wherein the aminoalkanoyl group may be an aminoacid residue derived from one of the one of the 20 naturally occurring amino acids or the optically active isomers thereof, or the racemic mixtures thereof wherein the amino residue is derived from alanine, arginine, asparagine, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, or valine; or.

A is $C_6H_{11}O_6$, SO_3H, or PO_3H_2,

R_{11} is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, or heterocyclic group,

X is CH, C-F, C-Cl, C-CH_3, C-CF_3, C-OCH_3, C-$OCHF_2$, C-OCF_3, N or when X is equal to C, the nitrogen atom to which R_1 is linked forms an optionally substituted 5-membered ring, 6-membered ring, 7-membered ring, with X of the adjacent ring, the ring containing carbon atoms and optionally one or more Y atoms wherein the one or more Y atoms are the same or different and are selected from NH, O or S; if the ring is substituted, the substituent is C_{1-6} alkyl group; and its pharmaceutically acceptable salts, hydrates, polymorphs and pseudopolymorphs.

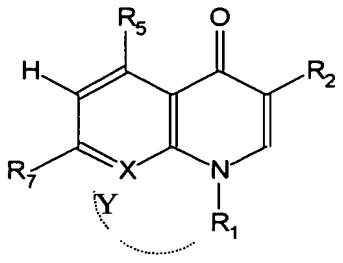
176.A pharmaceutical composition according to claim 175 wherein said efflux pump inhibitor has structure 2



Structure 2

wherein R_1, R_2, R_5, R_7, X and Y are as defined in claim 175.

177.A pharmaceutical composition according to claim 175, wherein said efflux pump inhibitor has the chemical structure 3 below



Structure 3

wherein R_1, R_2, R_5, R_7, X and Y are as defined in claim 175.

178.The pharmaceutical composition of claim 175, 176 or 177 further comprising an antimicrobial agent.

179.The pharmaceutical composition of claim 178, wherein said antimicrobial agent is an antibacterial agent.

180.The pharmaceutical composition of claim 175, 176 or 177 further comprising a macrolide or a ketolide.

181.The pharmaceutical composition of claim 180, wherein said macrolide or ketolide is selected from the group consisting of azithromycin, telithromycin, clarithromycin, erythromycin, rokitamycin, roxithromycin, spiramycin and josamycin.

182. The pharmaceutical composition of claim 175, wherein the efflux pump inhibitor is selected from the group consisting of:

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4′-amino-3′-methyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4′-(methylamino)-3′,3′-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

i-Propyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(4'-amino-3′,3'-dimethyl-piperidin-1-yl}-4-oxo-quinoline-3-carboxylate and its salts;

n-Butyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(4'-amino-3′,3'-dimethyl-piperidin-1-yl}-4-oxo-quinoline-3-carboxylate and its salts;

Ethoxycarbonylmethyl 1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4′-amino-3′,3′-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

Benzyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-{4′-(t-butoxycarbonyl amino)-3′,3′-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4′-N-(t-butoxycarbonyl-L-alanyl) amino-3′,3′-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4′-L-alanylamino-3′,3′-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(3′,3′-dimethyl-4′-(t-butoxy-carbonylvalinylamino)piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(3′,3′-dimethyl-4'-(L)-valyl-aminopiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4'-(L)-aspartylamino-3′,3'-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Ethyl-6,8-difluoro-1,4-dihydro-7-(4′-ethylaminopiperidin-1′-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(4′-amino-3′-methyl piperidin -1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(quinuclidinyl-3-yl-amino)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro-7- {(1∝,5∝,6∝)-6-amino-N-benzyl-3-azabicyclo [3.1.0] hex-6-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-(3′-Fluorophenyl)-6-fluoro -1, 4-dihydro -7-(4′-methylpiperazin-1′-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-(2,4-Difluorophenyl) -6-fluoro-1, 4-dihydro-7- (4′-ethylaminopiperidin-1′-yl)- 4-oxo-quinoline-3-carboxylic acid and its salts;

1-(2′,4′-Difluorophenyl)-6-fluoro-5-methyl-1, 4-dihydro -7-(4′-aminopiperidin-1′-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-(2′,4′-Difluorophenyl)-6-fluoro-5-methyl-1,4-dihydro-7-(4′-methylamino piperidin-1′-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3′-aminopyrrolidin-1′-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-{(1∝,5∝,6∝)-6-amino--N-benzyl-3-azabicyclo [3.1.0] hex-6-yl}-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

1-(2,4-Difluorophenyl) -6-fluoro-1, 4-dihydro-7-(3′-aminopyrrolidin-1′-yl)- 4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

1-(2,4-Difluorophenyl) -6-fluoro-1, 4-dihydro-7-{(1∝,5∝,6∝)-6-amino-N-benzyl-3-azabicyclo [3.1.0]hex-6-yl}- 4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

1-(2,4-Difluorophenyl)-6-fluoro-1,4-dihydro-7-(3′,3′-dimethyl-4′-hydroxy piperdin-1′-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

(RS)-(±)-9-Fluoro-6, 7-dihydro-8-{4′-(L-α-aspartyloxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

7H-Pyrido[1,2,3-de]-1,4-benzoxazine-9-fluoro-2,3-dihydro-3-methyl-10-(3′-ethyl 4′-hydroxypiperidin-1′-yl)-7-oxo-6-carboxylic acid and its salts;

7H-Pyrido[1,2,3-de]-1,4-benzoxazine-9-fluoro-2, 3-dihydro-3-methyl-10- (3′-amino methyl-4′-hydroxypiperidin-1′-yl)-7-oxo-6-carboxylic acid and its salt;

1-Cyclopropyl-6, 8-difluoro-5-methyl-1, 4-dihydro -7-(3′, 3′-dimethyl-4′-ethylamino piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salt;

1-cyclopropyl-6,7,8-trifluoro-5-methyl-1,4-dihydro - 4-oxo-quinoline-3-carboxylic acid;

(S)-(-)-9-Fluoro-6,7-dihydro-8- (3′, 3′-dimethyl-4′-ethylaminopiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro-7- (3′-aminomethyl-4′-hydroxypiperidin 1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro-7- (4′-dimethylamino-3′-methylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4′-cyclopropyl aminopiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4'-(t-butoxycarbonyl (L)-Ala-Ala)amino-3′, 3'-dimethyl piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4′-ethylamino-3′, 5′-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

Ethyl 1-(2,4-difluorophenyl) -6-fluoro -1, 4-dihydro-7- (4-amino-3-ethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylate;

1-(2,4-difluorophenyl) -6-fluoro-1, 4-dihydro-7- (4-amino-3, 5-dimethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

Ethyl 1-(2,4-difluorophenyl) -6-fluoro-5-methyl-1, 4-dihydro-7- (4-amino-3, 3-dimethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylate;

(S)-(-)-9-fluoro-6.7-dihydro-8- (4′-hydroxy- 3′-fluoropiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

10-Fluoro-11- (4-aminopiperidin-1-yl)-3,4-dihydro-4 (S)-methyl-8-oxo-2H, 8H-pyrido[1,2,3-ef]-1,5-benzoxazipin-7-carboxylic acid and its salt;

(RS)-(±)-6, 7-dihydro-8- (trans-4′-hydroxy-3′-methylpiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

(RS)-(±)-6, 7-dihydro-8- (cis-4′-hydroxy-3′-methylpiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts; and

(RS)-(±)-6, 7-dihydro-8- (4′-hydroxy-3′, 3′-dimethylpiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts.

183. The pharmaceutical composition of claim 181, wherein the efflux pump inhibitor is selected from the group consisting of:

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4′-amino-3′-methyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4′-(methylamino)-3′,3′-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

i-Propyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(4'-amino-3′,3'-dimethyl-piperidin-1-yl}-4-oxo-quinoline-3-carboxylate and its salts;

n-Butyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(4'-amino-3′,3'-dimethyl-piperidin-1-yl}-4-oxo-quinoline-3-carboxylate and its salts;

Ethoxycarbonylmethyl 1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4′-amino-3′,3′-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

Benzyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-{4′-(t-butoxycarbonyl amino)-3′,3′-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4′-N-(t-butoxycarbonyl-L-alanyl) amino-3′,3′-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4′-L-alanylamino-3′,3′-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(3′,3′-dimethyl-4′-(t-butoxy-carbonylvalinylamino)piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(3′,3′-dimethyl-4'-(L)-valyl-aminopiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4'-(L)-aspartylamino-3′,3'-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Ethyl-6,8-difluoro-1,4-dihydro-7-(4′-ethylaminopiperidin-1′-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(4′-amino-3′-methyl piperidin -1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(quinuclidinyl-3-yl-amino)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro-7- {(1∝,5∝,6∝)-6-amino-N-benzyl-3-azabicyclo [3.1.0] hex-6-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-(3′-Fluorophenyl)-6-fluoro -1, 4-dihydro -7-(4′-methylpiperazin-1′-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-(2,4-Difluorophenyl) -6-fluoro-1, 4-dihydro-7- (4′-ethylaminopiperidin-1′-yl)- 4-oxo-quinoline-3-carboxylic acid and its salts;

1-(2′,4′-Difluorophenyl)-6-fluoro-5-methyl-1, 4-dihydro -7-(4′-aminopiperidin-1′-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-(2′,4′-Difluorophenyl)-6-fluoro-5-methyl-1,4-dihydro-7-(4′-methylamino piperidin-1′-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3′-aminopyrrolidin-1′-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

A' Cont

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-{(1∝,5∝,6∝)-6-amino--N-benzyl-3-azabicyclo [3.1.0] hex-6-yl}-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

1-(2,4-Difluorophenyl) -6-fluoro-1, 4-dihydro-7-(3′-aminopyrrolidin-1′-yl)- 4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

1-(2,4-Difluorophenyl) -6-fluoro-1, 4-dihydro-7-{(1∝,5∝,6∝)-6-amino-N-benzyl-3-azabicyclo [3.1.0]hex-6-yl}- 4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

1-(2,4-Difluorophenyl)-6-fluoro-1,4-dihydro-7-(3′,3′-dimethyl-4′-hydroxy piperdin-1′-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

(RS)-(±)-9-Fluoro-6, 7-dihydro-8-{4′-(L-α-aspartyloxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

7H-Pyrido[1,2,3-de]-1,4-benzoxazine-9-fluoro-2,3-dihydro-3-methyl-10-(3′-ethyl 4′-hydroxypiperidin-1′-yl)-7-oxo-6-carboxylic acid and its salts;

7H-Pyrido[1,2,3-de]-1,4-benzoxazine-9-fluoro-2, 3-dihydro-3-methyl-10- (3′-amino methyl-4′-hydroxypiperidin-1′-yl)-7-oxo-6-carboxylic acid and its salt;

1-Cyclopropyl-6, 8-difluoro-5-methyl-1, 4-dihydro -7-(3′, 3′-dimethyl-4′-ethylamino piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salt;

1-cyclopropyl-6,7,8-trifluoro-5-methyl-1,4-dihydro - 4-oxo-quinoline-3-carboxylic acid;

(S)-(-)-9-Fluoro-6,7-dihydro-8- (3′, 3′-dimethyl-4′-ethylaminopiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro-7- (3′-aminomethyl-4′-hydroxypiperidin 1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro-7- (4′-dimethylamino-3′-methylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4′-cyclopropyl aminopiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4'-(t-butoxycarbonyl (L)-Ala-Ala)amino-3′, 3'-dimethyl piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4′-ethylamino-3′, 5′-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

Ethyl 1-(2,4-difluorophenyl) -6-fluoro -1, 4-dihydro-7- (4-amino-3-ethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylate;

1-(2,4-difluorophenyl) -6-fluoro-1, 4-dihydro-7- (4-amino-3, 5-dimethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

Ethyl 1-(2,4-difluorophenyl) -6-fluoro-5-methyl-1, 4-dihydro-7- (4-amino-3, 3-dimethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylate;

(S)-(-)-9-fluoro-6.7-dihydro-8- (4′-hydroxy- 3′-fluoropiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

10-Fluoro-11- (4-aminopiperidin-1-yl)-3,4-dihydro-4 (S)-methyl-8-oxo-2H, 8H-pyrido[1,2,3-ef]-1,5-benzoxazipin-7-carboxylic acid and its salt;

(RS)-(±)-6, 7-dihydro-8- (trans-4′-hydroxy-3′-methylpiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

(RS)-(±)-6, 7-dihydro-8- (cis-4′-hydroxy-3′-methylpiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts; and

(RS)-(±)-6, 7-dihydro-8- (4′-hydroxy-3′, 3′-dimethylpiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts.

184. The pharmaceutical composition of Claim 175 further comprising a fluoroquinolone.

185. The pharmaceutical composition of claim 184, wherein said fluoroquinolone is selected from the group consisting of ciprofloxacin, norfloxacun, levofloxacin, clinafloxacin, sitafloxacin, gatifloxacin, moxifloxacin, trovafloxacin, gemifloxacin and nadifloxacin.

186.The pharmaceutical composition of claim 175 or 185, wherein said efflux pump inhibitor is selected from the group consisting of:

1-Ethyl-6-fluoro-1, 4-dihydro -7-(1′, 2′,3′,4′-tetrahydroisoquinolin-2-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Ethyl-6, 8-fluoro-1, 4-dihydro -7-(4′-acetoxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Ethyl-6, 8-fluoro-1, 4-dihydro -7-(4′-{2′-(2′-oxazolidin-1-yl) ethyl} piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1- Ethyl-6, 8-difluoro-1, 4-dihydro -7-{(1∝,5∝,6∝)-6-amino-3-azabicyclo [3.1.0]-hex-3-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- ethyl -6, 8-difluoro-1, 4-dihydro -7-(3′-amino-5′-methyl pyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- ethyl-6, 8-difluoro-1, 4-dihydro -7-(4′-aminopiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- ethyl -6, 8-difluoro-1, 4-dihydro -7-{4′-(acetamido) piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- ethyl-6, 8-difluoro-1, 4-dihydro -7-{(1∝,5∝,6∝)-6′-(t-butoxycarbonyl amino)-3-azabicyclo [3.1.0]-hex-3-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro-7-(3′-acetamido-5′-methylpyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro-7-(3′-amino-5′-methylpyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro--7-(4′-acetoxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro -7-{4′-(dimethylamino) piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3′,5′-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro -7-(4′-hydroxy-3′,5′-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro- -7-(3′, 4′, 5′-trimethyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro- 7-(3′, 5′-dimethyl-4′-ethyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro-5-methyl- 7-(4′-ethoxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro-5-methyl- 7-(3′, 3′-dimethylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4′-(dimethylamino)-3′-methyl piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4′-hydroxy-3′-isobutyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4′-hydroxy-3′,3′-dimethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4′-hydroxy-3′,5′-dimethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(3′-methylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(cis-4′-amino-3′,5′-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6,8-difluoro-5-methyl-1,4-dihydro-7-(4′-hydroxy-3′-aminomethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(5′amino-2′-methyl-pyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{3′-(L-Ala-L-Ala) amino pyrrolidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{4′-(di-n-butylamino) piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{4′-(t-butoxycarbonyl-L-Ala-L-Ala)aminopiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(4′- propionoxy piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(4′-hydroxy-3′,3′-dimethyl-piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1, 4-dihydro -7-{4′-(1-pyrrolidinyl) piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-{4′-[(piperidin-4-yl) aminomethyl]-piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{(1,2′,2′, 6′,6′-pentamethyl piperidin-4-yl)methylamino}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1, 4-dihydro -7-(3′,5′-dimethyl morpholin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(4′-cyclopropyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(3′, 5′-dimethyl-4-pivaloyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

Ethyl 6,8-Difluoro-7-(4-hydroxypiperidin-1-yl)-1-(1-phenylthio-3(*S*)-but-3-yl)-1,4-dihydro-4-oxo-quinoline-3-carboxylate;

1- (2′-Trifluoromethylphenyl) -6-fluoro-1, 4-dihydro- -7-(3′, 3’, 4′-trimethyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- (2′-trifluoromethylphenyl)-6,8-difluoro-1, 4-dihydro -7-(morpholin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- (2′-trifluoromethylphenyl) -6, 8-difluoro-1, 4-dihydro -7-(3′,5′-dimethylmorpholin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- (2′-trifluoromethylphenyl) -6, 8-difluoro-1, 4-dihydro -7-(3′,5′-dimethyl piperazinyl-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- (4′-trifluoromethylphenyl) -6, 8-difluoro-1, 4-dihydro -7-(3′-aminopyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1- (4′-Fluorophenyl) -6-fluoro-1,4-dihydro -7-{4′-ethylamino)piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1- (2′,4′-Difluorophenyl) -6-fluoro-1, 4-dihydro-7-(3′, 5′-dimethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- (2′,4′-difluorophenyl) -6, 8-difluoro-1, 4-dihydro -7-(3′-hydroxy-5′-methylpyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- (2′,4′-difluorophenyl) -6, 8-difluoro-1, 4-dihydro -7-(3′,3′-dimethyl piperazinyl-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro -7-{(3′-aminoethoxycarbonyl)pyrrolidin-3-yl}-4-oxo-naphthyridine-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(pyrrolidin-3-yl-amino)-4-oxo-naphthyridine-3-carboxylic acid and its salts;

1- (2′,4′-Difluorophenyl) -6-fluoro-1, 4-dihydro -7-(piperidin-4-yl-amino)-4-oxo-naphthyridine-3-carboxylic acid and its salts;

Ethyl-1- (2′,4′-difluorophenyl) -6-fluoro-1, 4-dihydro -7-{[1∝,5∝,6∝]-3-N-benzyl-3-azabicyclo[3.1.0]hex-6-yl-amino}-4-oxo-naphthyridine-3-carboxylate and its salts;

1-(2,4-difluorophenyl) -6-fluoro-7-(1-phenyl-4,5,6,7-tetrahydropyrazolo [4,3-c]pyridin-1-yl-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid and is salts;

(S)-(-)-9-Fluoro-6,7-dihydro-8-(4′-carboxamidopiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

(R)-(+)-9-Fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid L-arginine salt;

(S)-(-)-9-Fluoro-6,7-dihydro-8-(4′-hydroxy-3′,3′-dimethylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

(S)-(-)-N-methylpiperidin-1-yl-9-fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate;

(S)-(-)-Morpholinoethyl-9-fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate and its salts;

Ethoxycarbonylmethyl (R)-(+)- 9-fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate;

N-1-{7-(1-cyclopropyl-6-fluoro-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-N-3-amino-{7-(1-(2,4-difluorophenyl)-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid)}-pyrrolidine;

N-1-{7-(1-cyclopropyl) -6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid)}-N-3-amino-{7-(1-cyclopropyl) -6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid)}-pyrrolidine;

N-1-{7-(1-cyclopropyl) -6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid)}-N-3-amino-{7-(1-cyclopropyl –6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-pyrrolidine;

N-1-{7-(1-cyclopropyl-6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid)}-N-4-{7-(1-cyclopropyl–6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-piperazine;

N-1-{7-(1-cyclopropyl-6-fluoro-5-methyl-1,4-dihydro-4-oxo-quinolone-3-carboxylic acid)}-N-3-amino-{7-(1-(2,4-difluorophenyl) -6-fluoro- 1, 4-dihydro-4-oxo-1, 8-naphthyridine-3-carboxylic acid)}-pyrrolidine;

N-1- {7-(1-cyclopropyl-6-fluoro-5-methyl-1, 4-dihydro-4-oxo-quinolone-3-carboxylic acid)}-N-4-amino {7-(1-cyclopropyl-6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-piperidine;

N-1- {7-(1-cyclopropyl-6-fluoro-5-methyl-1, 4-dihydro-4-oxo-quinolone-3-carboxylic acid)}-N-3-amino{7-(1-cyclopropyl-6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-pyrrolidine;

N-1- {7-(1-(2,4-difluorophenyl) -6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid)}-N-4- {7-(1-cyclopropyl-6-fluoro-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-piperazine;

N-3-azabycyclo{7-(1-(2,4-difluorophenyl)-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid)}-[1∝,5∝,6∝]-N-6-amino-{7-1-(2,4-difluorophenyl)-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid)}-[3.1.0] hexane; and

N-1- {7-(1-cyclopropyl-6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinolone-3-carboxylic acid)}-N-4-amino-{ethyl 2,3,6-trifluorophenyl-4-carboxylate}-piperidine.

187. The pharmaceutical composition of Claim 175 further comprising an antimicrobial agent selected from the group consisting of ciprofloxacin, levofloxacin, ofloxacin, gemifloxacin, nadifloxacin azithromycin, erythromycin, tetracycline, linezolid and novobiocin.

188. The pharmaceutical composition of claim 175 or 187, wherein said efflux pump inhibitor is selected from the group consisting of:

1-Cyclopropyl-6-fluoro-1, 4-dihydro-5-methyl- 7-(4′-methoxypiperidin -1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

7-Bromo-1-cyclopropyl-6-fluoro-5-methyl-1,4-dihydro-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4′-amino-3′-methylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4′-amino-3′-methyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-{3,3-dimethyl-4′-ethylamino piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4′-amino-3′-3′-dimethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4′-(dimethylamino)piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4′-hydroxy-4′-methylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(3′,3′-dimethyl-4′-hydroxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6,8-difluoro-5-methyl-1,4-dihydro-7-(3′-aminomethyl-4′-hydroxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(3′-aminomethyl-4′-hydroxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Ethyl-6,8-difluoro-1,4-dihydro-7-(3′-5′-dimethylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(4′-ethyl-3′-methylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3′-5′-dimethyl-4′-ethylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Ethyl-6, 8-difluoro-1, 4-dihydro -7-{(1∝,5∝,6∝)-6′-amino-3′-azabicyclo [3.1.0] hex-3′-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-(2′,4′-difluorophenyl)-6,8-difluoro-1,4-dihydro-7-(3′-aminopyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-{(3′-amimoethoxycarbonyl pyrrolidin-3-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(pyrrolidin-3′-ylamino)-4-oxo-naphthyridine-3-carboxylic acid and its salts;

1-(2′,4′-Difluorophenyl)-6-fluoro-1,4-dihydro-7-(piperidin-4′-ylamino)-4-oxo-naphthyridine-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro -7-(4′-amino-3′-ethylpiperidin-1-yl)-4-oxo-naphthyridine-3-carboxylic acid and its salts;

(S)-(-)-9-Fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid 0.2 hydrate;

(S)-(-)-9-Fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid . choline salt;

(S)-(-)-9-Fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid. 1-Hydroxyethylpyrrolidine salt;

(S)-(-)-9-Fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid. Diethanolamine salt;

(S)-(-)-9-Fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate. L-histidine salt;

(RS)-(±)-9-Fluoro-6,7-dihydro-8-{4′-(D-phenylalanyloxy) piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

(RS)-(±)-9-Fluoro-6,7-dihydro-8-{4′-(L-α-aspartyloxy) piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

(RS)-(±)-9-Fluoro-6,7-dihydro-8-{4′-(L-leucyloxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid dihydrochloride;

(S)-(-)-9-Fluoro-6,7-dihydro-8-{4′-(D-leucyloxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

(S)-(-)-9-Fluoro-6,7-dihydro-8-{4′-(L-alanyloxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

(S)-(-)-Morpholinoethyl-9-fluoro-6,7-dihydro-8-(4′-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate and its salts;

(R)-(+)-8,9-difluoro-6,7-dihydro-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2- [S-phenylalanyl-S-lysine methyl ester]carboxamide;

(RS)-(±)-9-Fluoro-6,7-dihydro-8-(trans-4′-hydroxy-3′-methylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

(RS)-(±)-9-Fluoro-6,7-dihydro-8-(cis-4′-hydroxy-3′-methylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

(S)-(-)-9-Fluoro-6,7-dihydro-8-(trans-4′-hydroxy-3′-methylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

7H-Pyrido[1,2,3-de]-1,4-benzoxazine-9-fluoro-2,3-dihydro-3-methyl-10-(4′-hydroxy-3′-ethylpiperidin-1′-yl)-7-oxo-6-carboxylic acid and its salts; and

10-Fluoro-11-[(1∝,5∝,6∝)-6-amino-3-azabicyclo[3.1.0]hex-3-yl]-3,4-dihydro-4(S)-methyl-8-oxo-2H,8H-pyrido[1,2,3-ef]-1,5-benzoxazepine-7-carboxylic acid, hydrochloride.

189. A method according to claim 59 wherein X is C and R_1 is selected from the group consisting of $-CH_2CH_2-$, $-CH_2Y-$, $-CH_2CH_2CH_2-$, $-CH_2CH_2Y-$, $-CH_2CH_2CH_2CH_2-$ and $-CH_2CH_2CH_2Y-$ where Y represents NH, O or S.

190. A method according to claim 62 wherein X is C and R_1 is selected from the group consisting of $-CH_2CH_2-$, $-CH_2Y-$, $-CH_2CH_2CH_2-$, $-CH_2CH_2Y-$, $-CH_2CH_2CH_2CH_2-$ and $-CH_2CH_2CH_2Y-$ where Y represents NH, O or S.

191. A method according to claim 66 wherein X is C and R_1 is selected from the group consisting of $-CH_2CH_2-$, $-CH_2Y-$, $-CH_2CH_2CH_2-$, $-CH_2CH_2Y-$, $-CH_2CH_2CH_2CH_2-$ and $-CH_2CH_2CH_2Y-$ where Y represents NH, O or S.

192. A method according to claim 69 wherein X is C and R_1 is selected from the group consisting of $-CH_2CH_2-$, $-CH_2Y-$, $-CH_2CH_2CH_2-$, $-CH_2CH_2Y-$, $-CH_2CH_2CH_2CH_2-$ and $-CH_2CH_2CH_2Y-$ where Y represents NH, O or S.

193.A method according to claim 167 wherein X is C and R_1 is selected from the group consisting of $-CH_2CH_2-$, $-CH_2Y-$, $-CH_2CH_2CH_2-$, $-CH_2CH_2Y-$, $-CH_2CH_2CH_2CH_2-$ and $-CH_2CH_2CH_2Y-$ where Y represents NH, O or S.

194.A method according to claim 169 wherein X is C and R_1 is selected from the group consisting of $-CH_2CH_2-$, $-CH_2Y-$, $-CH_2CH_2CH_2-$, $-CH_2CH_2Y-$, $-CH_2CH_2CH_2CH_2-$ and $-CH_2CH_2CH_2Y-$ where Y represents NH, O or S.

195. A method according to claim 171 wherein X is C and R_1 is selected from the group consisting of $-CH_2CH_2-$, $-CH_2Y-$, $-CH_2CH_2CH_2-$, $-CH_2CH_2Y-$, $-CH_2CH_2CH_2CH_2-$ and $-CH_2CH_2CH_2Y-$ where Y represents NH, O or S.

A1 Cont'd

196. A method according to claim 173 wherein X is C and R_1 is selected from the group consisting of $-CH_2CH_2-$, $-CH_2Y-$, $-CH_2CH_2CH_2-$, $-CH_2CH_2Y-$, $-CH_2CH_2CH_2CH_2-$ and $-CH_2CH_2CH_2Y-$ where Y represents NH, O or S.

197. A method according to claim 175 wherein X is C and R_1 is selected from the group consisting of $-CH_2CH_2-$, $-CH_2Y-$, $-CH_2CH_2CH_2-$, $-CH_2CH_2Y-$, $-CH_2CH_2CH_2CH_2-$ and $-CH_2CH_2CH_2Y-$ where Y represents NH, O or S.